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ROYAL COMMISSION

ON

INDUSTRIAL TRAINING AND TECHNICAL EDUCATION

REPORT OF THE COMMISSIONERS

Volume I of Part III

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OTTAWA

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**ROYAL COMMISSION ON INDUSTRIAL TRAINING AND
TECHNICAL EDUCATION.**

OTTAWA, 31st May, 1913.

The Honourable T. W. CROTHERS, K.C., M.P.,

Minister of Labour.

SIR,—By direction of the Royal Commission on Industrial Training and Technical Education we most respectfully submit Volume I of Part III of the Report.

JAS. W. ROBERTSON,

Chairman.

THOS. BENGOUGH,

Secretary.

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ENGLAND.

CHAPTER I: OUTLINE OF THE EDUCATIONAL SYSTEM.

SECTION 1: INTRODUCTORY.

A reasonably full statement is made of the character of the provisions for general education in England, and then a report is given in greater detail of examples of organization and of some types of classes, schools and institutions which provide education for industrial and technical purposes. It is not practicable to put within the limits of this Report anything like a full description of all that is being done or planned for in Industrial and Technical Education.

Perhaps nowhere else are better examples to be found of the separate parts of education, or of education organized for a single community, than in spots or places in England. The alleged defects and shortcomings of the "system" or want of a national system, were not discernible to the Commission in the several schools and institutions visited.

The outstanding feature was the extent and character of the work in Evening Classes. The voluntary attendance was surprisingly large—in some cities over 3 % of the total population. In the case of the University of Sheffield the attendance at Evening Classes in 1909 was 1390 as compared with 500 day students. At the Manchester Municipal School of Technology about 300 students attend the full day courses, about 700 come part time not exceeding one day per week, and nearly 5,000 take the Evening Classes.

No doubt the cities and towns visited were among the foremost in educational activity; and the leaders in them were those who spoke more anxiously concerning the need for covering the whole of their field still more adequately and effectively. Of what was left undone the Commission could not inform itself; but it learned much which will doubtless prove of benefit to Canada, from visiting the schools, seeing the attitude and work of the pupils, meeting the teachers, discussing the problems and outlook with the educational leaders, and examining the provisions made in the several communities.

A WORD ON NOMENCLATURE.

The nomenclature of the English schools is somewhat different from that of the schools of Canada. A word or two here will suffice to guard against misapprehension.

A Public Elementary School is known as a "Provided School" or "Council School" when it is provided and maintained by a public education Authority; it may be a "Voluntary School" or "Non-provided School" when it is provided by some other Body or persons. In both cases the Local Education Authority exercises control over expenditure for the maintenance of the educational work.

The Managers of "Non-provided Schools" are required to comply with certain conditions specified in the Education (England and Wales) Act 1902 in connection with the appointment and dismissal of the teachers, making such alterations and improvements in the buildings as may be required; keeping the school premises in repair; and giving religious instruction in accordance with the provisions of the trust deed relating to the school.

The renowned Public Schools like Eton, Rugby, Winchester, etc., are not in any sense "public" as Canadians use that word; but are privately endowed and controlled residential schools, attended almost exclusively by boys of the higher social classes, many of whom who are being prepared for the Universities or other institutions.

"Grammar" Schools are Secondary Schools for boys, and correspond in the main to the High Schools, Academies and Collegiate Institutes of Canada.

On the other hand, "High" Schools in England are usually Secondary Schools for girls, of a rank somewhat similar to the "Grammar" schools for boys.

THE MENACE OF "PAYMENT BY RESULTS."

It was frequently put forward that the absence of a logically arranged system or gradation of schools, each duly recognized as covering a definite field, led to the duplication of provision for pupils of different stages of advancement, particularly in Secondary Education; and that the provision for Secondary Education of recognized grade is greatly below the needs of the population in some localities. The passion for standardization by examination is disappearing. It is not forgotten that the greatest menace and injury to real education in England occurred during the period when the attempt at standardizing educational attainment was greatest and when stimulation from the Board of Education was given through a system of "payment by results." The results were ascertained by written examinations on prescribed subjects which led to "cram and drill" to circumvent the examiner, and to earn grants and promotions regardless of the education of the children by self-realization through their experiences. There is gratitude in the tones which speak of that as a thing of the past.

SPECIALIZATION FOR EXAMINATIONS.

No less an authority than Sir Joseph J. Thompson, President of the British Association for the Advancement of Science, at the time of the Winnipeg Meeting in 1909, said in regard to this matter in the case of more advanced students:—

The chief evil from which we at Cambridge [University] suffer, and which you have avoided is, I am convinced, the excessive competition for scholarships which confronts our students at almost every stage of their education. You may form some estimate of the prevalence of these scholarships if I tell you that the Colleges in the University of Cambridge alone give more than £35,000 a year in scholarships to undergraduates, and I suppose the case is much the same at Oxford. The result of this is that preparation for these scholarships dominates the education of the great majority of the cleverer boys who come to these universities, and indeed, in some quarters, it seems to be held that the chief duty of a schoolmaster, and the best test of his efficiency, is to make his boys get scholarships. The preparation for the scholarship too often means that about two years before the examination the boy begins to specialise, and from the age of sixteen does little else than the subject, be it mathematics, classics, or natural science, for which he wishes to get a scholarship; then, on entering the university, he spends three or four years studying the same subject before he takes his degree, when his real life work ought to begin.

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How has this training fitted him for this work? I will take the case in which the system might, perhaps, be expected to show to greatest advantage, when his work is to be original research in the subject he has been studying. He has certainly acquired a very minute acquaintance with his subject—indeed, the knowledge possessed by some of the students trained under this system is quite remarkable, much greater than that of any other students I have ever met. But though he has acquired knowledge, the effect of studying one subject, and one subject only for so long a time, is too often to dull his enthusiasm for it, and he begins research with much of his early interest and keenness evaporated. Now there is hardly any quality more essential to success in research than enthusiasm. * * * *

I am convinced that no greater evil can be done to a young man than to dull his enthusiasm. In a very considerable experience of students of physics beginning research, I have met with more—many more—failures from lack of enthusiasm and determination than from any lack of knowledge or of what is usually known as cleverness. * * * *

MUCH PROGRESS RECENTLY.

There is more or less intimate and cordial co-operation and more or less distant and intensive competition between the local Education Authorities, private Foundations, public and quasi-public Bodies, Universities and the Board of Education in the promotion of educational effort.

The Commission was impressed by the intellectual and social qualities of the men and women who were on educational committees; by the earnestness with which educational matters were being dealt with; and by the high attainments and abilities of the officials and teachers who were in charge of the administration of education in the several areas.

From all sides the Commission gathered the impression that during the past ten years a great awakening of endeavour had occurred, and that marvellous progress was being made in providing for the further education of boys and girls after the legal age for leaving the Elementary School. Only by an intimate knowledge of local conditions and history, would it be possible to trace the movement in such a way as to indicate all the forces at work. That was not attempted, but the Commission feels warranted in recording that what impressed it most deeply was the fact that the earnest service of a comparatively few enthusiastic and forceful men and women in any locality was concurrent with convincing evidence of progress, comprehensive planning, enlarged public support and increased efficiency in educational work.

A system or want of system that encourages local initiative, and the exercise of local responsibility and control, has obvious excellences not to be dismissed as a matter of course in favour of a system which calls for uniform conformity to detailed regulations and even high standards appointed without local action and advice. A variety of vital individual contributions ministers to growth and power among the vigorous. A proper function of "system" is to see that the weak and indifferent are not neglected.

TO RESCUE THE PERISHING.

The unsolved problem of England seems to lie with the multitudes of young people between 13 and 18 in the factory towns who are under par in physique, without the bracing stimulation of good homes and without the vision or the ambition to seek educational preparation for mature life. One cannot expect an old head on young shoulders, especially when the backbone has not been

well nourished morally or physically. However side by side with the glaring evidence of stunted life, from huddled conditions of working and living, are found plenty of proofs of strenuous efforts to meet the situation educationally and to bring about better conditions.

One did not find better classes or schools in Germany than in England; but the appearance of the young workers in the textile industries, for example, was immensely superior in Germany. That applied in some measure to the other factory workers in the two countries. On the other hand the factory workers in the woollen industries in the south of Scotland were evidently superior to the Germans in housing conditions and general bearing and surroundings. The intelligence, self-control and ability, that come from the union of education and industry, are perhaps only in their fullness for the children's children. England has a long way to make up; but the present direction and pace impressed the Commission as full of promise for the stability, growth and well being of the headquarters of the British Empire.

SECTION 2: ORGANIZATION AND ADMINISTRATION.

The Board of Education, which administers education in England, consists of a President, Parliamentary and Permanent Secretaries and office staff. The Premier, Chancellor of the Exchequer, the Principal Secretaries of State and the Lord President of the Council are ex-officio members of the Board, which is assisted by a Consultative Committee.

The chief Departments are: Elementary Education, Secondary Schools, Technological, Medical, Royal College of Art, Universities, Special Enquiries and Reports, Museums and Geological Survey. The Board has a full staff of Inspectors of both sexes for Elementary, Secondary and Technological Education and for physical exercises. The Welsh Department has a Permanent Secretary and Chief Inspector and a staff of Inspectors.

LOCAL ORGANIZATION.

By the Education (England and Wales) Act, 1902, School Boards—which up to that time served as the Authority for dealing with Elementary Education—were abolished, and the Council of the Borough, or in every administrative County the Council of the County, became the Local Education Authority, with powers of control and supervision over Higher as well as Elementary Education. Higher Education in this connection means “Education other than Elementary,” and includes the training of teachers and the giving of all kinds of education, whether technical, manual instruction, or any other kind. In regard to Elementary Education the Local Authorities somewhat vary. For instance, the Council of every County Borough (that is, a borough with a population of 50,000 and upwards which is constituted a county borough under the

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Local Government Act, 1888) is the sole Authority for Elementary as well as Higher Education, whereas the Council of a County has full powers as to higher education for the whole of its area, whilst the Council of every Borough within the County with a population of over 10,000 and the Council of every Urban District with a population of over 20,000 will each be, within its own area, the Local Education Authority for the purposes of Elementary Education. In the case of Higher Education the Council of every borough which is not a County Borough, and the Council of every Urban District, no matter what is its size, have concurrent powers to supply or aid the supply of education other than Elementary, provided that it does not raise, in any year, a sum exceeding that which would be produced by a rate of a penny in the pound. County Councils, acting quite independently of the small boroughs and urban districts, are empowered to raise rates for higher education for the whole of the County not exceeding twopence in the pound, or such higher rate as the Local Government Board may, in exceptional circumstances, consent to.

Every Local Education Authority exercises the powers and duties formerly undertaken by the School Boards and School Attendance Committees, and is responsible for and has control of all secular instruction in Public Elementary Schools, whether in a Council School (that is, a school provided by the late School Board or by the present Education Committee) or a Voluntary School (that is, a school provided by any other persons or Bodies). In this way the Education Committee of a Borough Council or a County Council or the Council of an Urban District is made responsible for the maintenance and efficiency of all Public Elementary Schools within its area. In other words it has unrestricted control over its own schools, technically known as "Provided Schools"; whilst it has complete control over all expenditure required for the purpose of maintaining and keeping efficient all Voluntary Schools technically known as "Non-provided Schools."

Each Local Education Authority appoints an Education Committee composed of Members of the Council and other persons interested in education, in a proportion defined by the Scheme for each Education Committee, with the approval of the Board of Education.

The Local Education Authorities under the Education Act (1902) include 62 County Councils, 72 County Boroughs, 136 autonomous Municipal Boroughs, 56 Urban Districts and the Scilly Isles; a total of 327. The Administrative Provisions Act authorized Local Authorities to aid by scholarships or bursaries the instruction in Public Elementary Schools of scholars from the age of 12 up to the limit of age fixed for the provision of instruction in Public Elementary Schools (16 years) and with the consent of the Government Board of Education to extend this aid beyond the age of 16 years. This Act also provides that money may be expended in maintaining vacation schools and classes, play centres or other means of recreation for children attending the Public Elementary Schools. Medical inspection of children immediately before or at the time of their admission is required of the Local Authorities.

REGULATIONS OF BOARD OF EDUCATION.

The regulations of the Board of Education endeavour to discourage early specialization by insisting on sound general education up to 16 at least, and require that the curriculum provide duly graded and continuous instruction in subjects necessary for a well-balanced education. They provide for elasticity in the scope and content of the courses and for the encouragement of local initiative in meeting the varying requirements of different areas and making fullest use of existing means. A large amount of liberty is allowed in framing the curricula according to the requirements of the area, and in defining the aim which the particular school sets before itself.

The Board encourages experiments and a healthy variation of type. The fullest freedom is allowed, consistent with real efficiency in the education provided. In addition to the general increase of elasticity, which has always been kept in view, and which the Board has been able to give in successive revisions of the regulations, special provision has lately been made for encouraging, by means of a special grant, any carefully devised educational experiment of a pioneer and promising nature in methods of teaching.

All improvements of curriculum depend on the establishment of Preparatory Schools with a satisfactory age of entry and adequately prolonged school life, and a sufficient and efficient staff.

In 1906 the Board introduced a regulation forbidding grant-earning Secondary Schools to have classes containing more than 35 pupils, and fixing the normal maximum at 30. Subsequent regulations make it clear that classes of between 30 and 35 are allowed only as an exceptional arrangement to meet special or temporary difficulties of classification.

The County Funds for Higher Education are provided by a general County rate and by Government grants (Customs and Excise) and from the various Trade Guilds which are both numerous and wealthy, especially in London. In recent years the amounts derived from the Customs and Excise have decreased considerably and the Government has promised to set aside a portion of the Land Tax to make up the deficiency.

WORKING OF ACT OF 1902.

A good example of how the Act of 1902 works out is furnished by the Administrative County of Lancashire.

The County Education Committee, when considering the best method of obtaining the funds for Higher Education, decided in favour of levying a general county rate for the purpose of aiding or supplying Higher Education throughout the county. They came to the conclusion that, owing to the great difficulty of determining the area which a Secondary Day School, or in a less degree an Evening Technical School, should serve, a system of differential rating could not be devised which would be practicable and generally recognized as just.

"Local" Higher Education Committees were formed as sub-committees of the County Education Committee and these sub-committees were made

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responsible for all evening schools and classes within their respective districts. Each local Higher Education sub-committee must submit annually to the Lancashire Education Committee for approval: (1) the scheme of work to be carried out within the area of the local sub-committee, and (2) an estimate of the income and expenditure for carrying out the proposed scheme.

It is necessary that the scheme of the local sub-committee should be submitted for approval in order to ensure that the instruction given within the area of that sub-committee shall fit in with the general scheme of education for the county and avoid the unnecessary establishment of schools and classes doing similar work of an advanced character within immediately contiguous areas, and in the interests generally of efficiency and economy.

AN "EXAMPLE" EDUCATION COMMITTEE.

The Lancashire Education Committee undertakes to provide out of County funds for the carrying out of any approved scheme of a local Higher Education sub-committee to the following extent:—

(a) In the case of rural districts where there are no concurrent rating powers the County Committee provides the whole cost after taking into consideration the fees and Government grants which the rural districts may receive.

(b) In the case of Boroughs or Urban Districts possessing concurrent rating powers the County Committee provides a sum equal to that contributed by the Borough or Urban District until the amount of the contribution is equal to that of the proceeds of a local penny rate. For any expenditure beyond this amount the County Committee undertakes the entire responsibility.

At the close of each financial year the Higher Education accounts of each District are audited by the County Auditor, who in the course of his examination of the accounts requires to be satisfied that the actual expenditure has been in accordance with the approved scheme.

The Lancashire County Education Committee urges upon local committees the importance of bringing the Day and Evening Schools into closer contact. With this object in view they have empowered the local sub-committees to admit to the Evening Classes free of charge (a) children who have left the Day School during the twelve months immediately preceding the session during which they attend Evening Classes for the first time, (b) children who are qualified to leave the Day School at the commencement of the Evening School session or who are expected to leave before the end of December. In addition to this, under a recent revision of the scale of salaries paid to school attendance officers, increases of salary were granted only to such of the officers as definitely undertook to interview children about to leave the Day School with the object of inducing them to immediately enter Evening Classes.

SECTION 3: THE ELEMENTARY SCHOOLS.

In the Public Elementary Schools in 1907-8 there was an enrollment of 5,984,130 pupils, equivalent to 17% of the population; and the average attendance was 88% of the enrollment. The number of professors and teachers in these schools was 177,628. In the Training Colleges for elementary teachers there was an attendance of 10,492.

The total expenditure for Elementary Education in 1907-8 amounted to £21,987,002 (\$107,000,000) almost exactly one half of this coming from Parliamentary grants and the balance from rates, fees and other local sources. The Children's Act, though not strictly an educational measure, extends the province of the Local Education Authorities considerably, especially through school attendance officers, and strengthens directly and by indirect influence the compulsory school attendance laws.

The purpose and trend of Public Elementary Education is set forth in the Introduction to the Elementary School Code of 1909:—

The purpose of the Public Elementary School is to form and strengthen the character and to develop the intelligence of the children entrusted to it, and to make the best use of the school years available, in assisting both girls and boys, according to their different needs, to fit themselves practically, as well as intellectually, for the work of life

With this purpose in view, it will be the aim of the School to train the children carefully in the habits of observation and clear reasoning, so that they may gain an intelligent acquaintance with some of the facts and laws of nature; to arouse in them a living interest in the ideal and achievements of mankind, and to bring them to some familiarity with the literature and history of their own country; to give them some power over language as an instrument of thought and expression, and, while making them conscious of the limitations of their knowledge to develop in them such a taste for good reading and thoughtful study as will enable them to increase that knowledge in after years by their own efforts.

The school must at the same time encourage to the utmost the children's natural activities of hand and eye by suitable forms of practical work and manual instruction; and afford them every opportunity for the healthy development of their bodies, not only by training them in appropriate physical exercises and encouraging them in organized games, but also by instructing them in the working of some of the simpler laws of health.

It will be an important though subsidiary object of the School to discover individual children who show promise of exceptional capacity, and to develop their special gifts—(so far as this can be done without sacrificing the interests of the majority of the children), so that they may be qualified to pass at the proper age into Secondary Schools, and be able to derive the maximum benefit from the education there offered them.

And, though their opportunities are but brief, the teachers can yet do much to lay the foundations of conduct. They can endeavour, by example and influence, aided by the sense of discipline which should pervade the school, to implant in the children habits of industry, self-control, and courageous perseverance in the face of difficulties; they can teach them to reverence what is noble, to be ready for self-sacrifice, and to strive their utmost after purity and truth; they can foster a strong sense of duty, and instil in them that consideration and respect for others which must be the foundation of unselfishness and the true basis of all good manners; while the corporate life of the school, especially in the playground, should develop that instinct for fair play and for loyalty to one another which is the germ of a wider sense of honour in later life.

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In all these endeavours the school should enlist, as far as possible, the interest and co-operation of the parents and the home in an united effort to enable the children not merely to reach their full development as individuals, but also to become upright and useful members of the community in which they live, and worthy sons and daughters of the country to which they belong.

The Code sets forth the following principles and suggestions:—

INFANTS:

The principal aim of the school in relation to infants is to provide opportunities for the free development of their bodies and minds, and for the formation of habits of obedience and attention. The subjects should include physical exercises in the form of games; the telling of stories to the children by the teachers to lead them to form ideas and to express them in simple language of their own.

For older infants the exercises should be supplemented by short lessons in recitation, drawing, reading, writing, very simple arithmetic and singing.

Instruction in sewing and knitting *may* be given, but care must be taken to avoid fine work and injury to eyesight.

OLDER SCHOLARS:

In schools for older scholars the subjects described below should be taught in a manner suitable to the age and capacity of the several classes. It is not necessary that all the subjects should be taught in every class:—

The English language, including recitation, reading silently for information, and composition; Handwriting, taught with a view to speed as well as legibility; Arithmetic, including practical work in measuring and weighing and practical instruction in mensuration; Drawing, including modelling, avoiding the use of flat copies and instead practising the direct representation, at sight and from memory, of actual objects, proceeding from simple to complex forms; Observation lessons and Nature study, which may be connected with the teaching of gardening to the older scholars; Geography, including the use and making of maps; History, including a knowledge of the lives of great men and women and the lessons to be learnt therefrom, and, in connection therewith, lessons in citizenship in the higher classes; Singing, and elementary musical knowledge; National and Folk songs to be freely used throughout the school; Hygiene and Physical training, which may include instruction and practice in swimming; Domestic subjects (for girls only), including needlework, knitting, cookery, laundry work and housewifery; Moral instruction, specially directed to the inculcation of courage, truthfulness, cleanliness of mind, body and speech, the love of fair-play; consideration and respect for others, gentleness to the weaker, kindness to animals, self-control and temperance, self-denial, love of one's country, and the appreciation of beauty in nature and in art.

STAFFING OF SCHOOLS.

Every school or department must have a head teacher either certificated or recognized by the Board of Education as having, under their regulations, the status of a certificated teacher. He must undertake no outside duties which occupy any part of the school hours.

Every school or department must have at least one certificated teacher (inclusive of the head teacher) for every complete group of eighty scholars in average attendance.

In any school the number of scholars on the register of any class or group of classes under the instruction of one teacher must not exceed 60.

No person who is a clerk in Holy Orders or the regular Minister of a congregation can be recognized as part of the staff of a school or department.

A certificated teacher under the regulations of the Board is one who has passed the Board's Final Examination of Students in Training Colleges for Teachers or an alternative final examination recognized by the Board (e.g. The final examination for certificate of the University of Cambridge in theory, history and practice of teaching together with the certificate of practical efficiency in teaching, etc.).

A candidate for recognition by the Board as an uncertificated assistant-teacher must have passed the King's Scholarship Examination or the Preliminary Examination for the Elementary School Teachers' Certificate held by the Board or an alternative examination recognized by the Board as of equal value.

Where the Board are satisfied that the circumstances of the case render it necessary they may recognize from time to time as supplementary teachers, suitable women over 18 years of age who are specially approved by the Inspector for their capacity in teaching, but not more than two supplementary teachers will be recognized on the staff of a department at any one time.

Student teachers or Pupil Teachers are recognized by the Board as "teachers undergoing preliminary education" under special regulations.

In no case will the staff of a school be considered sufficient by the Board of Education unless (in the aggregate) it is *at least* equivalent for the average attendance of the school or department allowing approximately 35 scholars for the Head teacher, 60 for each certificated teacher, 35 for each uncertificated assistant teacher, and 20 for each student teacher or supplementary teacher.

HAND WORK IN SCHOOLS.

Since the Education Act of 1902 the development toward a system providing instruction adapted to the needs of all children has given to industrial arts work in many schools a place almost as important as that of any other school subject. In most of the English cities handicraft work for boys, and domestic economy for girls are found with well equipped shops and laboratories. Although there is great variety in details of curriculum and method, most of the schools are developing the work from the industrial standpoint. Its purpose is avowedly vocational, yet there is increasing attention to the educational or liberal elements involved. In most towns "centres," are established in connection with one school, and the pupils of that school and neighboring schools are given instruction in that centre. These centres are well equipped. In London by 1909, accommodation had been provided for over 80 per cent of all the children. All boys in Grade VI who are eleven years of age or more may take the handicraft work, as may all boys also who are over twelve but below Grade VI. Most of the centres for handicraft give woodwork, and this is suitably combined with drawing. Metal work is given in a few centres.

For girls, centres are provided for domestic economy. Three divisions of this work are offered—cookery, laundry work, and housewifery. Girls of Grade V, and girls of twelve years of age below Grade V, are eligible to receive instruction in domestic economy. The work varies with the need of the particular districts in which the centres are located. Practical utility for the girls in their homes is a dominant factor in shaping the courses. A full half-day is usually given to the work each week for both boys and girls, the teacher thus having two groups each day. In a few cities in England periods are so shortened as to permit of three groups each day. In almost every school a series of models is found which usually combines the logical sequence idea with the industrial, that is, projects of appreciable utility are chosen and are so arranged that they

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provide the sequence for the development of tool processes and technical progress. In a few cities the Sloyd system is found almost wholly unmodified. Most courses are planned to cover two or three years.

Below the grades doing work in centres or shops, there is often a well-developed course in handwork. Paper folding, cardboard construction, wire-work, cord-work, and parcel-tying are often found. Clay modelling is occasionally employed. Knitting and needlework are very common in the lower grades.

MEDICAL INSPECTION.

According to Dr. Sadler, medical inspection of schools is conducted in co-operation with the medical department under the Board of Education, which was constituted in 1907 and has been extended and strengthened each following year. In the 327 local education areas, 307 school medical officers have been recognized, and in 224 of these cases the medical officer appointed was the medical officer of health of the area, and thus in the majority of the cases a more or less complete unification of the two medical services was secured, while in the remaining cases some degree of effective co-ordination, either personal or administrative is the rule. The experience in this service thus organized illustrates in a striking manner the vital relation between medical inspection of schools taken in this most restricted sense and consideration of the external sanitation of the school, the sanitation and hygiene of the home and the whole business of securing cleanliness. Much of the medical work is already of proved value and the medical inspection is yielding substantial results in practical form. In almost all educational areas this new work is contributing to wider knowledge of child life than has been obtainable in the past. It cannot fail to guide, encourage and foster the highest kind of social development. To this must be added the beneficent result of medical treatment for tens of thousands of school children, while the increased attention devoted to school hygiene, including the whole health conditions and physical training of the child, is already beginning to bear fruit in a better conception of the true ends of a State system of education.

CARE COMMITTEES AND THEIR WORK.

The organization of Care Committees, under the general direction of Local Authorities, to look after the condition of necessitous children attending the schools is one of the most interesting signs of the awakening of the public conscience of England to responsibility for the welfare of the people. These Committees are of the greatest utility in much of the work in relation to the physical condition of the children. They take an interest in all matters concerning the physical well-being of the children and co-ordinate all agencies bearing on this work outside the school. When a Children's Care Committee is appointed the members endeavour to procure cleansing medical treatment or the amelioration of the existing physical condition of all children referred to them by doctors or nurses in the medical report book of the school, penetrating to the

homes and endeavouring to interest more particularly the indifferent parents who do not attend to see the doctor and whose children are the difficult cases in which to obtain improvement. The Committees have also the duty of determining which children are necessitous.

EFFICIENCY OF ELEMENTARY SCHOOLS.

The efficiency of the Elementary School training was strikingly illustrated by Mr. R. Blair, Education Officer of the London County Council, in a paper before the Educational Science Section of the British Association, at the Sheffield meeting. As a result of enquiries he had sent out to many leading industrial and commercial firms in England, he stated that almost all of them explained their preference for Elementary School boys in such a way as to pay a well deserved compliment directly to the adaptability of the Elementary School boy and indirectly to the existing system of education. A good many spoke in high terms of the value of Evening Schools, including Technical Institutes and Schools of Art. Banks and Insurance and some other firms generally sought for the Secondary School product. Mr. Blair drew this conclusion: "catch the boy as soon as he leaves the Elementary School and induce him to attend Evening Classes; add to that the training of the workshop or the business house and you have the fairly common plan of training those who will rise above the rank of "hands." One of the greatest industrial leaders in England states that at the present moment all the men who fill positions of responsibility in his office came from Elementary Schools. He adds that they belong to a period when Secondary Schools were not so accessible as now and that the same remark may not be applicable to their successors."

SECTION 4: HIGHER ELEMENTARY SCHOOLS.

The Higher Elementary Schools take children at about twelve years of age, giving them a course of three or four years. The curricula are made to fit the needs of particular localities. Some are distinctively industrial in their bearings, giving work as in the Centres for Industrial Arts but devoting more time to the shops or laboratories, and making the mathematics, English and drawing as definitely practical as possible. Others of these schools emphasize commercial subjects, while still others are general in their nature.

These schools afford the only means of prolonging the systematic education of the majority of the children in Great Britain, and the Government offers an inducement to Local Authorities to maintain schools of this advanced grade by an extra grant when they conform to specified conditions.

Manchester, which under the regime of the School Boards, led the country in the establishment of Higher Grade Schools, has recently organized six Higher Elementary or Central Schools of a new type which are more fully dealt with in our report under Manchester.

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While the conditions attached to the extra grant for these schools are especially helpful in smaller communities they have not proved entirely satisfactory to the education authorities of the large cities. In London, schools of this class have been withdrawn and Central Schools have been started with an industrial or commercial or domestic arts bias. These schools are organized for pupils over 11 years of age and are more directly industrial in their aim than those subject to the regulations of the Board of Education for Higher Elementary Schools. They are vocational in character, using that word as now current in educational discussions in this country, and are reported on hereafter under Central Schools in London.

From 1901 to 1904 Higher Elementary Schools provided four courses of instruction of a predominantly scientific character and the minimum age of admission was 10. Under the Code of 1905 and subsequent Codes a new type was created which provided for only a three years course, but the former requirements as to science instruction were withdrawn and the aim now is to continue the general education of the pupils and provide them with instruction bearing on their future vocations, but not of a specialized character. Such curriculum must provide "a progressive course of instruction in the English language and literature, in elementary mathematics, and in history and geography; drawing and manual work for boys and domestic subjects for girls must be included in every case as part of the general or special instruction." With some necessary exceptions admission is to pupils over 12 who have been at least 2 years in a Public Elementary School. The Schools must also be organised to give at least a 3 years course approved by the Board of Education, but this course may be extended if, in the opinion of the Inspector, the pupils would profit thereby, and a suitable fourth year course has been organized. Courses beyond the fourth year are not recognized in the distribution of the Government grant. In this way the Board of Education sets the highest limit for the courses of Elementary Education.

Such Higher Elementary Schools are established either by Local Education Authorities or by Voluntary Managers. In either case they are supported by Government grants and by local rates imposed under the authority of the Council. The Voluntary Managers cannot establish one of these schools without the consent of the Local Education Authority.

Further information regarding this field of education is given from page 80 to page 87 in Part II. of the Report, and also in Chapters VII., IX. and X. of this Part of the Report.

SECTION 5: SECONDARY AND HIGHER EDUCATION.

The distinction between Elementary and Secondary Schools was formerly in large measure a social one, but since the Act of 1902 this distinction is disappearing. Further, there is a tendency in England, as in France and Germany, to make the upper and lower age limits of Secondary Education 12 and 18 years.

The Board of Education is taking steps to enforce where necessary the definition of a Secondary School as regards the normal length of school life, and

normal leaving age. Several authorities have adapted, with effective results, rules by which parents undertake (in some cases under penalty) to keep children at the Secondary School either for the full school course or for a named minimum period, unless for some approved reason. The education authorities in one of the larger County Boroughs in the North of England lowered the age of candidates for Junior Scholarships to between 10 and 12, and require an undertaking that pupils shall not leave before the end of the school year following their 15th birthday. They have also established a system of maintenance allowances in suitable cases, extending to the completion of the school course, and will seek for the repayment of these allowances, and all fees remitted, in the case of pupils who without sufficient reason fail to complete the full period arranged for.

They hope thus to solve the problem of the flooding of schools with pupils who leave after a year or two, and hence cause a waste of a great part of the educational effort and expenditure.

Practically nothing has existed in England which could be regarded as a system of Secondary Education under State control. It is therefore almost impossible to say anything in general of work in industrial arts in Secondary Schools. The great so-called "public" schools, Eton, Rugby and others, have very largely retained their distinctly classical character. St. Albans is a notable exception in its giving much attention to science, practical mathematics, and industrial arts.

GENERAL INTEREST IN INDUSTRIAL EDUCATION.

Although system, in the way of organized uniformity of type and progression, has been wanting in the whole field of Secondary Education in England, and has but slowly developed in Elementary Education, the general interest in Industrial Education has been so keen as to have exercised a marked influence on the character of the work undertaken in the schools maintained for general education. Holding to a theory different from that prevailing generally on the continent, English educators have felt that it was undesirable and unwise to treat Industrial Education as a thing separate from general education. The theory that a trade cannot be taught in a school, and also that it cannot now be taught fully without a school, is tending towards such a correlation of technical work and cultural subjects that a form of general and vocational education is being evolved for the industrial workers which appears to be yielding satisfactory results and meeting with general favor.

SCIENCE, DRAWING AND SHOP WORK.

Through Government grants from about 1881, aid was given to local initiative in the organization of science schools of Secondary rank. In 1889 authority was given to the County Councils to aid schools of whatever kind in furthering Technical Education by local taxation, and in 1890 local rates were largely relieved by a substantial annual grant from Parliament. Through this aid and influence the Secondary Schools willing to develop the "modern side" have introduced

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strong courses in science, drawing and shop work. Many schools of a distinctively industrial type, as the Central School of Arts and Crafts, London, have been developed in recent years. These are maintained or aided by public funds. But they are distinctly separate in their aim from the plan of general education, and are to be classed with the numerous and effective Technical and Evening Schools for the further education of those who have left the regular schools and, in most cases, who have already entered the ranks of industrial workers.

THE UNIVERSITIES.

Inasmuch as Universities have set the standards (by means of examinations) and given an impetus to almost all educational methods, they have been dominating factors in the direction of educational effort. The Universities have also provided the training for the highest grades of teachers, have educated most of the leaders in scientific research and in public affairs in relation to education, and have steadfastly set forth their ideals.

The Oxford and Cambridge type has been supplemented by the rise in 1880 of Victoria University of Manchester, with which was affiliated, at a later date, University College at Liverpool and Yorkshire College at Leeds. In 1903 the latter two became respectively the University of Liverpool and the University of Leeds.

The University of Birmingham arose in 1900 out of Mason University College and took in the Queen's Medical College of Birmingham.

There are Universities also at Bristol, Newcastle-on-Tyne, Nottingham, Reading, Sheffield and Southampton.

At these 10 modern Universities there were 7,796 Day Students and 5,736 Evening Students in attendance in 1910. Besides these there were 9,600 Day Students and 405 Evening Students as Internal Students of the 31 Colleges and Schools of the University of London, about 3,800 Students in the 22 Colleges of Oxford and about 3,700 Students in the 18 Colleges of Cambridge.

Wales is served by University Colleges at Aberystwyth, Bangor and Cardiff. On the occasion of the opening of the new buildings for the University of Wales, His Majesty King George V, as Chancellor of the University, said: "We must look ahead and endeavour to be ready to meet all the requirements of scientific and intellectual progress. The imperative necessity for higher education and research is becoming more and more recognized."

CHAPTER II: TECHNICAL EDUCATION.

SECTION 1: GENERAL PROVISIONS.

Although England since 1837 has given State Aid for diffusing a knowledge of the Mechanic Arts and the principles of design, and had as early as 1815 encouraged such instruction in Mechanics' Institutes, her first attempt to provide for so doing through the regular school system was not until about 1860. The "Great Exhibition" held in 1851 in the famous Crystal Palace, London, by demonstrating the inferiority of English manufactures, resulted in the organization of the Science and Art Department at South Kensington, which made grants in aid of classes covering work in these branches.

In 1857 the Education Department was re-organized and made to include the Science and Art Department.

In 1859 that Department established an examination for teachers, and those who obtained certificates of competency to teach could earn payments in proportion to the number of pupils passed. The instruction had to be given in a school approved by the Department, and local managers were required to guarantee for the school's support a sum equal to the Government grant.

From 1861, Government grants were made for work in both Science and Art in some of the Secondary Schools in which it was found readily applicable, where the modern side of education was developing.

Under the Act of 1870 the work in Science and Art was introduced into the upper grades of the Elementary Schools. In 1872 special programs were promulgated giving definite plans for this work in the schools, but as reported by the Royal Commission of 1895, "County Councils have generally found it unwise, if not impossible, in dealing with children of school age, to treat Technical Instruction as a thing separate from general Secondary Education."

GRANTS TO TECHNICAL EDUCATION.

The Technical Institutions Acts of 1889 and 1891 authorized the levying of a local tax of a penny in the pound for Technical Education, and the Local Authorities receive also considerable revenue from grants under a Customs and Excise Act. Such grants are commonly known as the "Whisky Money."

In recent years the amounts derived from that source have decreased considerably, and the Government has promised to set aside a portion of the land tax to make up the deficiency. The Government also gives other grants for the support of Technical Education. These are paid to Local Education Authorities on the basis of work provided for and done.

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GENEROUS AID TO INDUSTRIAL ARTS.

Although it is not quite exact to speak of England's "system" of schools prior to 1902, it is fair to say that the schools providing for general education of Elementary and Secondary rank had often received, where disposed to utilize it, rather generous aid in the introduction and development of subject matter in Industrial Arts. The distinctively industrial bearing of the drawing and of the science work, wherever introduced, seems to justify rating these subjects as industrial. The impetus given to industrial drawing, industrial design, and industrial physics and chemistry, as these subjects were directed by the Science and Art division of the Education Department in the 70's, 80's, and 90's, is said to have meant much to England in the development of manufacturing industries through this last quarter of a century.

During the last twenty-five years the "Manual Training movement" had made itself markedly felt. The infant schools had developed simpler forms of handwork through the influence of the kindergarten idea. Woodwork for boys, and knitting and sewing for girls, made their way slowly into the upper grades.

Although great numbers of boys left school at 12 or 13 years of age to enter the ranks of the industrial worker, many had a foundation laid or an interest developed in the Science and Art work which brought them immediately into the Evening Schools or into the numerous supplementary day schools for continuing the work in science and industrial design.

DRAWING, DESIGN AND ART.

Throughout England the Provincial Schools of Art are doing excellent work in forming popular taste, while the Elementary and Secondary schools are laying strong foundations by means of instruction in drawing, and in artistic handicraft.

Mr. Dalgety Dunn, in speaking before the International Congress on Drawing and Art as to the position of these subjects in Great Britain, said:—

When we consider the extraordinary progress made in drawing during the past ten years, we may reasonably anticipate a further advance, due to greater cohesion between classes, simplified instruction, higher professional and practical attainments on the part of teachers, and an extended school age for pupils. . . . Art teaching as a vital and necessary feature of public instruction is now generally recognized. In many ways our work has extended from the drawing of a few years ago; apparent difficulties have been smoothed away, and now nothing is heard of the impossibility of finding time for Nature and other kinds of drawing. . . . Drawing, Modelling, Colouring are some of the means by which we may hope to develop and direct self-activity.

EXISTING PROVISIONS.

In Technical as well as in popular education, England has been a laggard. In commerce and industry she had a long start, but not until she felt the pressure of competition from Germany and France did she face the question of providing educational opportunities for training her artisans. Until the great educational enactment of 1889, the Mechanics' Institutes were in the main the

only means whereby the working or the middle classes continued or supplemented the inadequate provision of the Elementary schools. These Institutes from the early days of the nineteenth century were the fore-runners of the present Technical Education.

The forms of provisions for further education are recognized under three divisions viz.—(1) Evening Schools and Classes; (2) Schools of Art; and (3) Technical Institutions.

Technical Education is now provided by Technical Day Schools, “Trade” Schools and Evening Classes, to which should be added the Central Schools and the Higher Elementary Schools, some of which provide courses with an industrial outlook, but without attempting instruction of a specifically technological character. The higher forms are provided for at the Municipal Technical Institutes, at many of the Universities and at the Imperial College of Science and Technology.

Practically all the English towns have well organized co-ordinated systems of Technical Education, but only such institutions have been featured in this Report as seemed to the Commission to offer specially useful suggestions for Canada.

SECTION 2: EVENING CLASSES.

A CHARACTERISTIC FEATURE.

All authorities agree that Evening School instruction has been one of the most characteristic features of the English educational system. In no other country is greater zeal shown in the attendance at Evening Classes organized upon a purely voluntary basis. The educational facilities thus afforded are evidently appreciated more than ever by intelligent and vigorous young people, especially in the great centres of industry and commerce.

Dr. M. E. Sadler, one of the leading authorities on education in Great Britain says “ I can find no country in which voluntary attendance at Evening Classes is so large in proportion to the adult population as it is in England and Wales.”

In all the English cities visited by the Commission, Evening Classes were an outstanding feature. This remark, subject to local modifications, would apply to Great Britain generally.

STRIKING FACTS AND FIGURES.

The following figures show the position of Evening Schools under Government Inspection in England and Wales in 1906-7:—

Number of Evening Schools recognized by the Board of Education	5,933
Number of students in respect of whom grants were paid by the Government.....	551,968
Number of students who attended at any time during the year. (A student attending more than one school is counted once for each school).....	736,512

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The same in groups of ages at entry:

Between 12 and 15 years of age.....	132,898
Between 15 and 21 years of age.....	362,627
Over 21 years of age.....	240,987

The same divided according to sex:

Male.....	442,416
Female.....	294,096

Fees:

Number of students who paid for instruction.....	613,806
Number who received free instruction:	
Admitted without fees.....	92,426
Whose fees were subsequently returned in full.....	30,280
Amount of grant paid by the Government.....	£361,596

Taking the population of England and Wales in 1906-7 (Statesman's Year Book) at 34,701,776, the percentage of attendance at Evening Classes would be 2.12, or over 21 per thousand of the population. There has been considerable increase during more recent years.

VIEWS OF THE PRESIDENT OF THE BOARD.

The Rt. Hon. Walter Runciman, President of the Board of Education, in his address on the Budget in the House of Commons in 1910, stated that the work done in these Evening Classes covers a vast range of subjects, and the Board of Education was not prepared to exclude any subject providing that it came properly within the category of the classes and that any reasonable subject of real educational value might count for the purposes of the grant. He added that a great deal of the work was of the greatest value, instancing a visit to a technical class at Burnley where he found some of the best pure science classes in the United Kingdom, no fewer than four of seven scholarships granted in the Kingdom having been won by that school. He expressed the opinion that the work done in these classes must depend largely on the amount of time occupied by the student's daily work, and thought it was impossible for the student commencing work at six in the morning and continuing till 5.30 in the evening with short intervals for breakfast and dinner only, to have enough energy to take full advantage of the Evening Classes, the usual time allowed for these classes (six hours per week) placing a strain upon the students far beyond what they could bear. He had heard of some young students in Leeds breaking down under it. He instanced places where they would have been able to attend such classes during the day by permission, and even encouragement of employers, citing Middlesboro', Manchester, Harwich, Birmingham, Coventry, Derby and Swindon. He thought a word of credit was due to the Admiralty for having led the way in this matter, because as early as 1843 they allowed some of the young persons working in their dockyards and shops to attend technical classes during work hours. Some of the railway companies are now taking this subject up with a degree of enthusiasm which does them every credit. Recently the Great Northern Railway Company have been insisting that in every case, boys

in their employ in London, of whom they have a very large number, should attend some classes, many of which are held during working hours. He believed that only by following this plan would it be possible to get into the schools the boys between the ages of 13 and 17 in such a way as to enable them to take full advantage of the facilities there offered them.

PROVISIONS IN LONDON.

In London the Evening Schools tend to five fairly distinct types:—(1) The ordinary Continuation School, collecting the old scholars from neighbouring day schools, staffed as far as possible with teachers from those schools, and mainly concerned to keep those scholars together and prevent their losing what they have learned; (2) Higher Grade Continuation Schools often developing into the Commercial School, the scholars, generally from the better class of homes, being past the VII standard and coming to the Evening School with a definite object; (3) Polytechnics and Schools of Art where the apprentice or improver and also the skilled workman find the means of widening their knowledge and skill; (4) The Commercial School, where the clerk finds instruction in languages or commercial geography or the machinery of business; (5) The distinctively College work, represented by such Colleges as King's College, the Birkbeck, the London School of Economics and also by some of the Polytechnics and other institutions.

THE UNIVERSITY OF SHEFFIELD.

The following brief statement concerning the University of Sheffield is given chiefly to indicate the extent and character of the Evening Classes carried on by the University. There are 500 day and 1,390 evening students in attendance. Similar Evening Classes are conducted by other Universities.

APPLIED SCIENCE DEPARTMENT.

The reputation of the city of Sheffield as the birthplace of the iron and steel manufacture is one which the city fathers and manufacturers are most anxious to maintain. The intention of the Department of Applied Science is to train students in the best known scientific methods of producing steel. Evening Classes and week-end lectures in the surrounding district are co-ordinated with the Department.

The Department specially concerns itself with the application of Science to (i) Mining; (ii) Metallurgy; (iii) Commercial life.

I. Mining.

A. The work done *at the University* includes,—

- (a) Degree Course, covering 3 or 4 sessions;
- (b) Diploma Course, covering 3 or 4 years, during which students receive instruction concurrently at the University and at a colliery;

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(c) Saturday Courses:—

1. Certificate Course in Mining, covering Mining, Chemistry, Mechanics, Mine Surveying, Machine Drawing, and Steam—2 years course, held on Saturday afternoons.
2. Electricity applied to mining—2 years course, held on Saturday afternoons;
3. Mining Teachers' Course, for practical men who have had a good training and wish to teach in local Mining Classes under County Councils—1 year, Saturday afternoons.

B. The work done *outside Sheffield* includes,—

- (a) Saturday Course at Derby, similar to the one held at the University;
- (b) Extension Lectures in Mining, Mining Chemistry, Mechanics and Physics;
- (c) Work done in connection with local Mining Classes under the supervision of the University.

Applied Chemistry.

The Department of Applied Chemistry is closely allied to the Mining Department, Chemistry being an important and necessary subject for future mine managers or engineers.

The literary side of mining education is not overlooked, being as important as the technical side.

II. Metallurgy.

Students are not promoted in this Department until they have satisfactorily completed the Mining Course, although the two Departments are quite separate. A special feature of this Department is a Laboratory for the use of former students, who can come here to study problems which they have encountered in their daily work. This post-graduate laboratory is greatly appreciated.

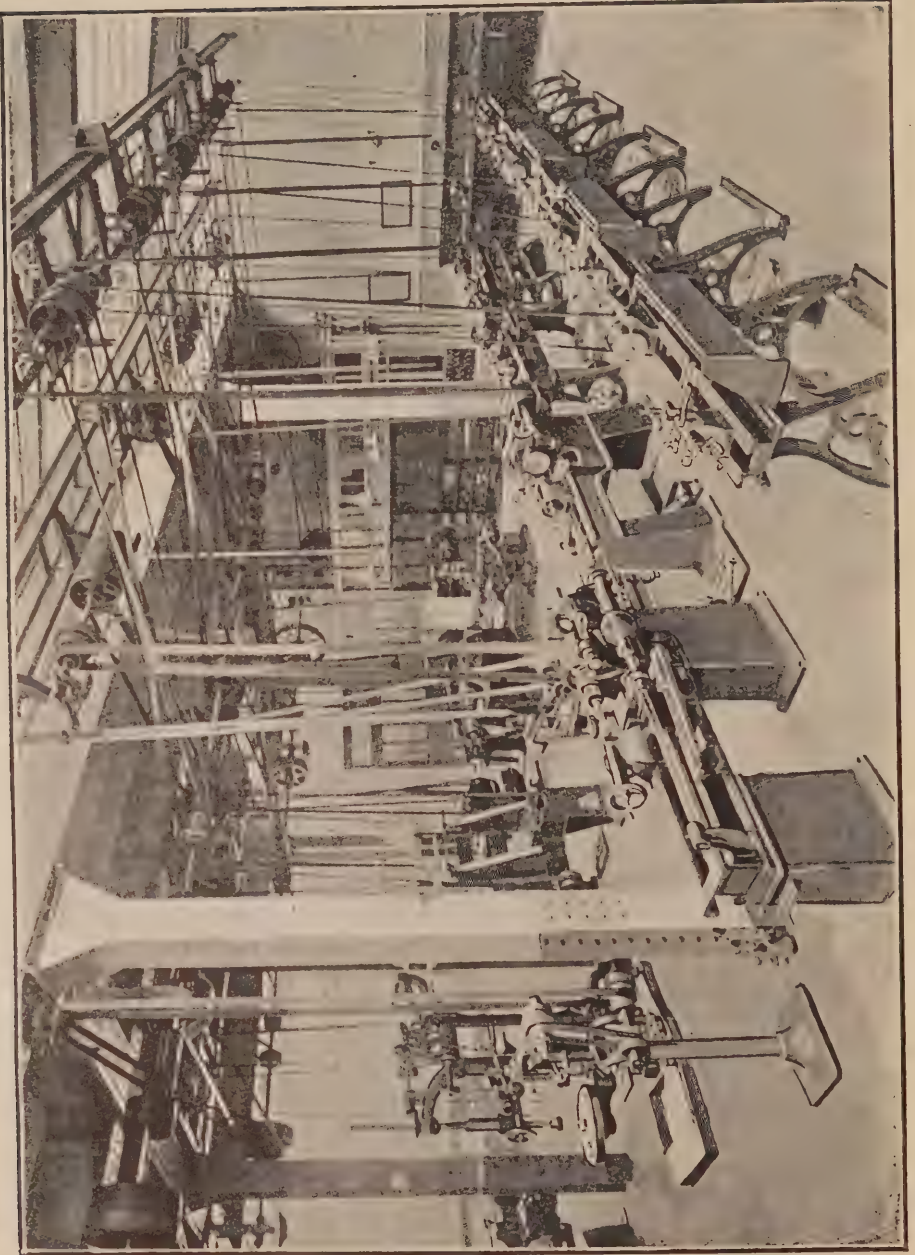
The equipment is ample and up-to-date, suitable for the requirements of students in every branch of this Department. There is a carpentering shop, in which students make patterns for the machines, of which they sometimes make the moulds in the foundry, cast and fit them up in the tool shops. The workshops include fitting shop, machine tool shop, woodwork shop and smiths' shop fitted up with the most modern machinery. The drawing office accommodates 80 students at a time.

III. Electrical Engineering.

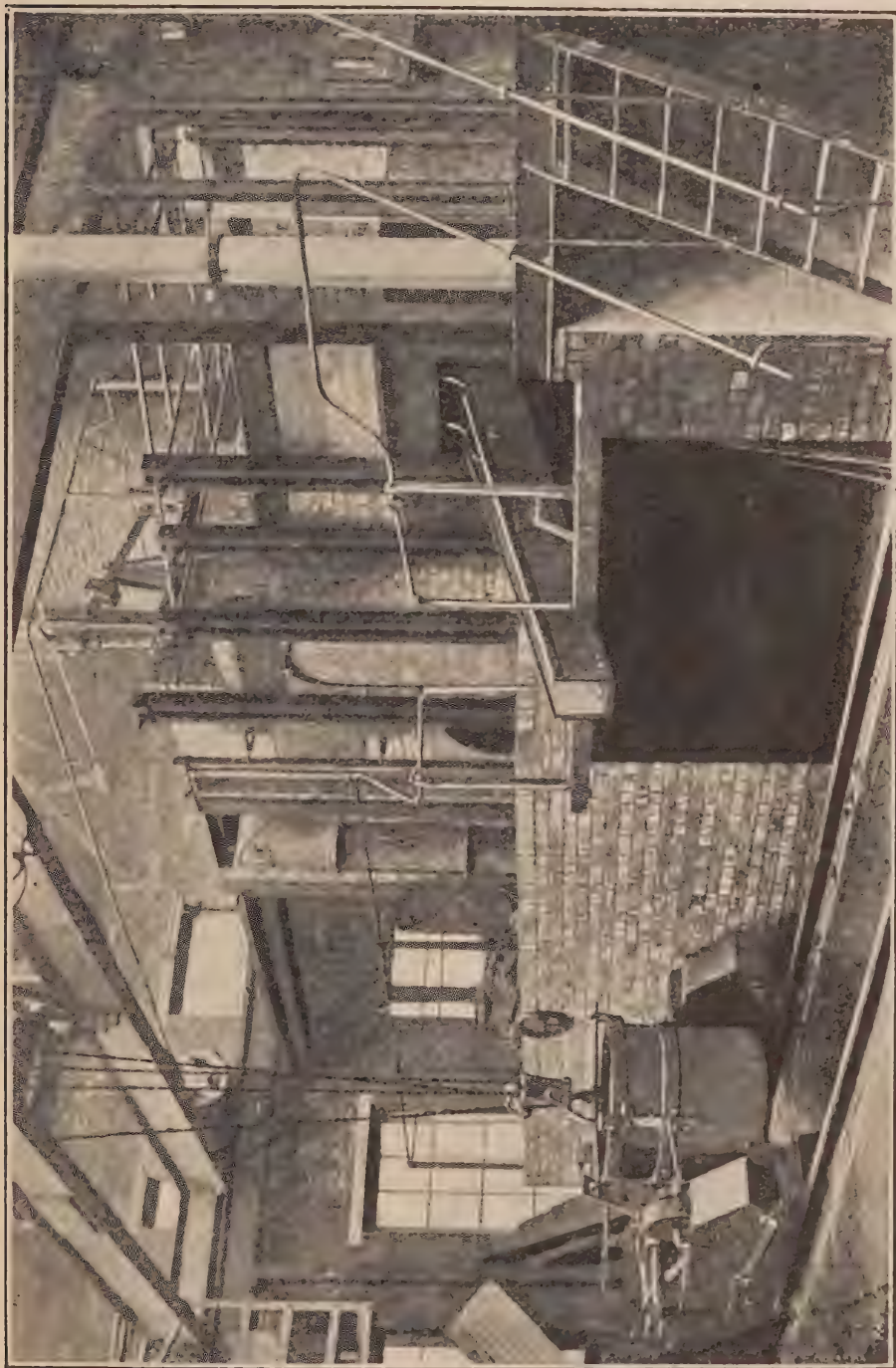
The Engineering Course covers 3 years, and includes attendance at lectures and classes, experimental work in the laboratories, and practical work in the drawing office, workshops and machine tool shops. The Department of Electrical Engineering has three electro-technical laboratories, one for each year of the Course.

EVENING CLASSES.

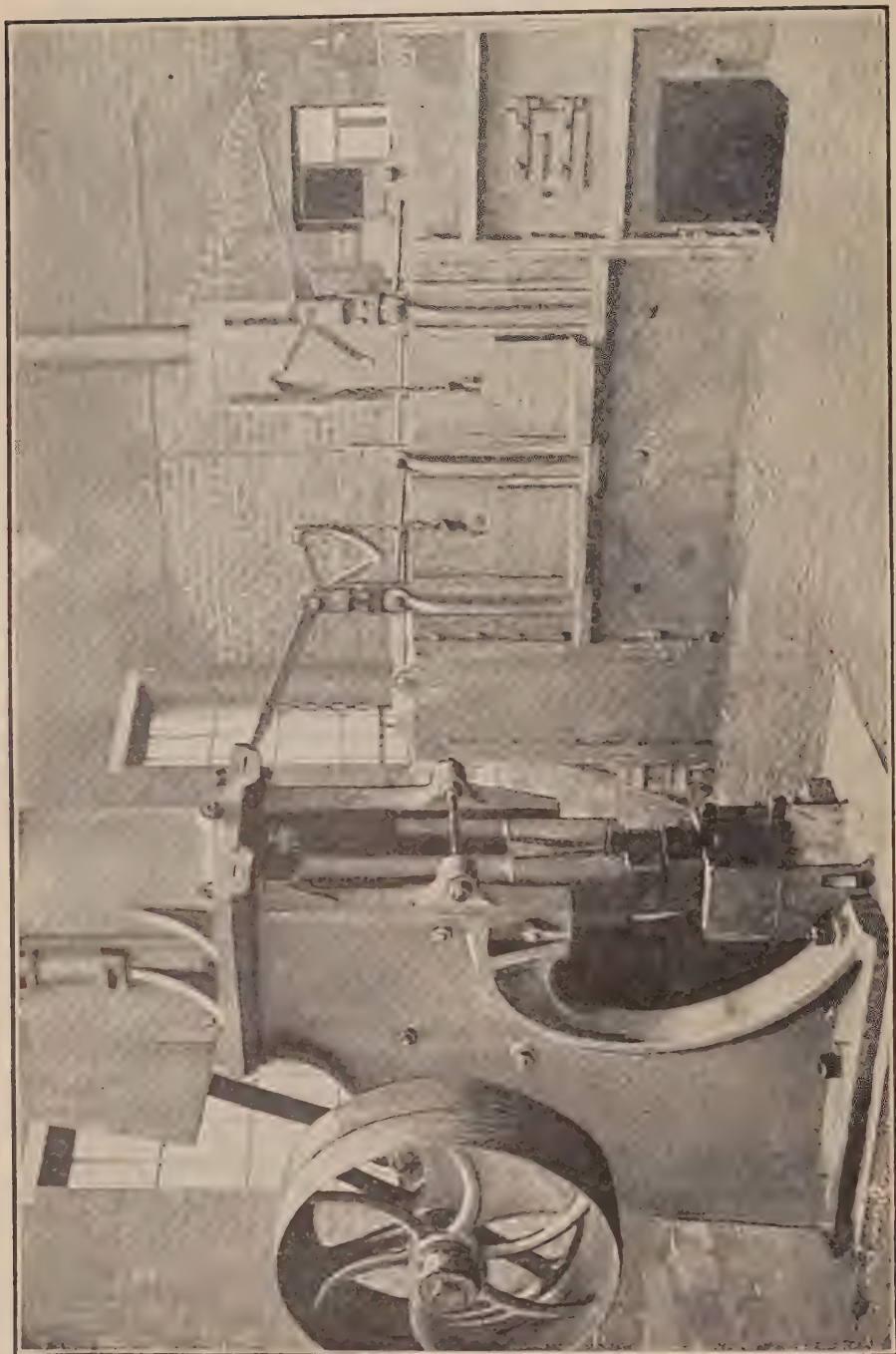
The Evening Classes, which are a most marked and successful feature of the University, have full advantage of the organization and equipment of the Applied Science Department. Many of the students take the Associateship Examination.



UNIVERSITY OF SHEFFIELD: THE TOOL ROOM.



UNIVERSITY OF SHEFFIELD: 2-TON SIEMENS FURNACE.



UNIVERSITY OF SHEFFIELD: HALF-TON ELECTRO-PNEUMATIC HAMMER AND RE-HEATING FURNACE.

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1. Before going to the Examination for Associateship, they must furnish certificates of having attended during at least four University years a Course of Study approved by the University of not less than six hours a week.

2. They must satisfy the Examiners in five subjects selected from the following:—

1. Pure and Applied Mathematics.
2. Theory of Machines.
3. Strength of Material and Theory of Structures.
4. Hydraulics.
5. Thermodynamics, Heat Engines.
6. Civil Engineering and Surveying.
7. Civil Engineering Design.
8. Generation, Transmission and Distribution of Electricity.
9. Design of Electrical Machinery.
10. Theory and Practice of Machine Tools.
11. Machine Drawing and Design.
12. Geology.

Associateship in Iron and Steel Metallurgy.

To take this Associateship, applicants must furnish the Examiners with certificates of having attended three years of Day Classes or four years of Evening Classes, including, for Evening students, attendance of six hours a week.

They must furnish certificates of having passed in:—

1. Metallurgy of Crucible Steel.
2. Metallurgy of Cast and Wrought Iron and Siemens and Bessemer steel.
3. Fuel and Refracting Materials.
4. Geology and Mineralogy.
5. Mechanical Drawing (only required for Day Students).

They must satisfy the Examiners at the end of their Course in

6. Pyrometry.
7. Micrographic Analysis.
8. Chemical Physics of Iron and Steel.

They must pass an oral examination in 1, 2, 3, 6, 7, 8.

CHAPTER III: CONVERSATION WITH MR. FRANK PULLINGER.

Information obtained in "Conversation" with MR. FRANK PULLINGER, Chief Inspector of Technical Schools for The Board of Education for England.

The border line between Elementary and Technical Schools and Elementary and Secondary Schools has not been very sharply defined in England. The Board of Education finds it a difficult matter to deal with, but hopes the new regulations will make a better line of division than at present.

There are three kinds of schools for Industrial or Technical Instruction:—(1) the Evening Schools; (2) what may be called part-time Day Schools; (3) full-time Day Schools.

The latter are perhaps the most important, though not the most numerous. There are three grades of those. The first grade is for boys and girls who have just left the Elementary Schools, called Day Continuation Schools, which Mr. Blair will have called Trade Schools. In those schools it is hoped to have a continuation of the general education such as is given in Elementary Day Schools, and with it a definite instruction in trade subjects.

As a rule the Day Continuation Schools will make 12 years the lowest limit of age for entrance. It depends on the age in any particular town at which the scholars leave the Elementary Schools. In London they leave at 14, and some trades in London, especially those for girls, do not admit scholars till they are 14. The Borough Polytechnic admits pupils at 12. Arrangements must be made at those schools in accordance with different trades. For instance, a boy at 12 cannot be taught a heavy trade like engineering, for he is not strong enough, and such trades will not be taught; but trades connected with such industries as light wood-work, especially cabinet making, etc., could be taught to such boys. Girls could be taught laundry work, dressmaking, waist-coat making and such light trades.

DAY CONTINUATION SCHOOLS.

Under the head of Day Continuation Schools there will be a great variety of schools. It is not proposed to lay down any regulations as regards curriculum, but none of those schools will ever do less than 6 hours a week of Manual Instruction—that term including not merely wood and iron work, but laundry work, dressmaking, etc.—and some of them will do nearly twice as much, out of a total of 30 hours a week.

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These schools will no doubt provide a good deal of teaching in manual work in wood and iron, but for the most part the curriculum will be rather general, with a decided bent in the direction of those studies which will be useful to the boy when, on leaving school, he enters some mechanical engineering trade. He will do plenty of Drawing of a very suitable kind—drawing from actual objects, first of all simple geometrical models, then from actual machine details of one kind or another that are found in various machines.

No doubt a good many of the Central Schools in London will be classed as Day Continuation Schools and carried on under the regulations for Technical Schools. Similar schools can be seen in Leeds. Those schools do not grow very quickly, having had little encouragement from the Board of Education in the way of grants. The Board's experience with them hitherto has not been very satisfactory, because to succeed they must be thoroughly appreciated and supported by employers, who have no very great faith in Technical Education. As a general rule the education must first be provided without the demand, which has to be created.

In seeking to bring about the attendance at the Day Continuation Schools of those who might be disposed to earn money, or whose parents might be careless about them continuing in the school, the arrangement preferred is one under which employers give first preference, in filling up the posts of apprentices, to lads who have been educated in these schools, where tolerably advanced work is done by boys who have remained there for three or four years.

PRACTICAL TEACHERS AND TRADE ATMOSPHERE.

The headmasters of the Day Continuation Schools and as many instructors as possible will be drawn from the ranks of the Elementary teachers, but especially from men who have had trade experience. That will be one of the tests which will distinguish between a Day Continuation School carried on under the technical regulations of the Board of Education, and any other school, whether Secondary or Elementary.

In a Cabinet-making School, for example, the greatest effort will be made to secure that there shall be a thoroughly practical atmosphere in the school and that the staff for mathematics, science and the different advanced technical subjects shall be equipped by trade experience, and shall have been themselves trade apprentices. The proportion of the week's time to be given to manual or manipulative or trade work has not been settled.

INTERMEDIATE SCHOOLS—THE NEW APPRENTICESHIP.

Above the Day Continuation Schools there are a number of schools—which might be called Intermediate Schools, in which boys are admitted at 15 or 16 after having attended a Secondary School from the age of 12 and received a purely general Secondary Education. All Secondary Schools are supposed to have a certain amount of Manual Training, but it only comes to about two hours a week.

These full time schools for scholars of 15 or 16 are going to be very important indeed. Their main object is to give lads a two years' course of preparation for an apprenticeship which starts rather later than the usual apprenticeship, taken by boys leaving Elementary Schools. A great many of the better class workmen, foremen and managers, can afford to let their boys stay at school until 16 or 17, and then send them on as ordinary apprentices into the works. These schools will be able to do a good deal better work than the more elementary Day Continuation Schools, because the lads will have had a better preliminary education, and they will be staying at school longer; but of course the standard of instruction will not reach that of the Universities and large Technical Colleges. They will have definitely a two year course. As a matter of fact, there are very few places where employers will take apprentices when they are more than 17; and some engineering firms will allow two or three years in a Technical College to count towards the third year of apprenticeship. That is the sort of thing it is desirable to see extended. While it might be thought a boy at 18 would be very acceptable in industries after such a school as this, yet numbers of industries do not want such as those, for a boy who pursues his education up to 18 or 19 wants more salary than the average apprentice could get; and some engineering employers say that they can run their works on a very small proportion of highly-educated men. The graduates from these Intermediate Schools are the men who would, after experience in the works, become foremen and heads of departments, etc. The combination of school and workshop would be a new species of apprenticeship.

FULL TIME TECHNICAL SCHOOLS.

The captains of industry would be recruited from the next kind of full-time Day Technical School, namely, those which are held in Universities and in the best Technical Colleges, to which it is expected nobody will be admitted until 17 or 18. This kind of school is already in existence in a good many universities and big Technical Colleges, such as Northampton College.

These three different kinds of Day Technical School are in many places in England now very much mixed up. There is a very considerable tendency in schools which ought to be of the highest grade, in which there are not very many students, to admit boys who are not sufficiently prepared. In quite a number of cases the schools could not at present be classified.

The curriculum of the lowest grade of Continuation School should be prepared definitely for lads who are to be apprentices at 15 or 16, and cannot give enough time to general training in mathematics, science or literary subjects to be prepared for the next grade. The first grade of school would be very much like the Central Schools in London, with a bent towards industry or commerce. It is not desired to have boys going to the Central Schools and then on to the University, the ordinary avenue to which is through the Secondary Schools. A boy should get to the Secondary School from the primary at 11 or 12.

As regards co-ordination of these three different kinds of schools, the Day Continuation School will not as a general rule be a place of preparation for the

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next higher grade, it being considered that every grade of day Technical Instruction should be preceded by full-time day instruction of a thoroughly general character. Thus a student preparing for the highest grade of Technical School would get purely Secondary Education at the Secondary School till 17 or 18, though in the last year or two he might devote more attention to mathematics or science than purely literary subjects. The desire is to see boys go to the intermediate grade of Technical School from Secondary Schools where they have been getting a purely general education till 15 or 16.

Although as a general rule every grade of full-time Day Technical School should be preceded by a purely general education, yet there must be exceptions such as in the case of boys who develop for the first time when they reach these technical schools; and if they develop, there should be no bar to them going on to the next grade of school. The teachers would have to be relied on for guidance in such cases.

TWO SORTS OF HIGHEST TECHNICAL SCHOOLS.

There will be two sorts of Technical Schools of the highest grade: (1) That to which boys are admitted after four or five years in the Secondary School: (2) Another, intended for boys who started their apprenticeship between 14 and 16, have attended Evening Schools and then have been selected by rigorous tests as being sufficiently qualified to go on with full time day education for two or three years.

A scheme of that kind is going on at present on the North-East coast. A boy leaves the Elementary School at 13 or 14, goes into engineering works at once, and starts attending Evening School; then, at 18, the best of those lads are selected by the principals of the Technical Schools and the employers jointly. The employer has a record as to whether the apprentice is a satisfactory workman, a good time-keeper, and all the rest of it; the principals of the Evening Technical Schools have a record of his intellectual attainments, and between them they pick out the very best apprentices and give them a three years' full time day course. The Board of Education gives grants to those schools. In some cases the boy's employer pays his fees; in some cases he also pays wages; sometimes he may pay half wages, but wages are not paid to as great an extent as they should be. There are scholarships as well. That is the sort of school it is desired to increase.

THE SANDWICH SYSTEM.

In an engineering town like Sunderland or Manchester, it is desired to have a boy stay at a Public Elementary School till 13, then go full time to a Day Continuation School till 16, then to the works as an apprentice attending Evening School, then have a chance of getting to another full-time school at 18, after two years in the works—the sandwich system. This latter school, having regard simply to the interests of the students, is a very different kind from the ordinary technical course carried on in the University and attended by boys

whose previous education has been in Secondary Schools; yet these artisan students at the places named do extraordinarily good work, and very advanced; they are first-grade students. They give their whole time to the day school for six months a year for three years after having spent two years in the works.

PART-TIME DAY SCHOOLS.

Part-time Day Schools, where employers arrange to let apprentices off for periods from two to four hours in the daytime, come next. These are a very varied class of school. In some cases the schools go on for one, two, three or four months in the year, the best examples of these being the Farm Schools, carried on in winter. It is hoped to have a considerable development of Building Trade Schools in winter, when these trades are slack. There are, perhaps, 100 part-time schools where employers allow their apprentices to attend school for half a day, one or two days, per week. There are schools for two hours a day, such as railway schools, from 7-9 in the morning, before starting work. In the School of Technology at Manchester, instruction is given on Mondays from 9 a.m. to 6 p.m., with an hour off for dinner, making 8 hours per week, the employers letting their apprentices off. Another school is in Harwich, near Bolton, the headquarters of the Bolton & Lancashire Railway Co., where they have two afternoons a week. In such cases the employers pay the apprentices their wages during the time they are in school; it counts just as though they were in the works. This sort of thing needs very careful organization. The mere fact that a lad is picked out by his employer as being a first-class apprentice and fit to attend school in the daytime for a number of hours per week generally gives that lad a better opportunity of getting higher wages. Cases have arisen where a lad has started as an apprentice under one employer, who paid his fee at the beginning of the session in September or October, and by January that lad had gone off to another employer and was getting higher wages. Such might be remedied by reserving part of the boy's wages till the end of the year. It may be taken as a rule that whatever time is given under this practice to school work is paid for. At the School of Technology in Manchester they have a similar course for plumbers and painters and decorators; at Middlesborough, in Yorkshire, they have a school of that kind, and at a good many other places.

Mr. Pullinger thought the best arrangement was to give instruction on one day of the week, especially on Monday, after the lad's week-end rest. At the Westminster Technical School, in London, there are part-time day classes for Gas Works apprentices of the London Gas, Light & Coke Company. These are young lads who have just left the Elementary School and become apprentices, and they do not all come on the same day, but have some sort of a shift arrangement.

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GOVERNMENT DOCKYARDS SCHOOLS.

One of the very best examples of part-time day instruction is to be found in the Government Dockyard Schools carried on by the Admiralty in all the dockyard towns. Before a lad can become an apprentice in a Government dockyard, he must pass an examination, and as the number of candidates is very large, the Admiralty have a pick of boys. When a lad gets into the dockyard he attends the part-time school for 12 hours a week—six hours in the day and six in the evening. At the end of the first year the Admiralty have an examination and weed out from their school about 50% of those lads as unfit for further instruction; at the end of another year they rule out 50% of the remainder. The result is that in the third and fourth year they have material of extraordinary excellence; and these lads, with 12 hours' instruction weekly, do splendid work. These dockyards have been going on for 60 years, and it is amazing to find that, with such an experience before them, other employers in engineering do not follow the example, for the Admiralty certainly would not do it unless it paid them. A boy must be 14 before he enters for the admission examination, and if he fails the first time, he can have an examination the year after.

EVENING SCHOOLS.

As to Evening Schools, they are very numerous in England, and as good as they are anywhere. Mr. Pullinger did not like the notion of a boy working at night, especially the young boys. The leakage from one year to another in the Evening Schools is enormous, which, he had no doubt, was due largely to the fact that the lads were physically unfit to stand it three times a week for a couple of hours after working 10 hours.

In some towns the organization is excellent, and it has not been at all difficult to lay down a scheme of what the Department wants carried out. In the best organized towns there are preparatory courses for lads who leave the Elementary Schools rather prematurely—say, at 13—and other boys who have left the Elementary School and have neglected to go on to an Evening School immediately, but have allowed two or three years to elapse. In a few cases there are Preparatory Classes for people of 20 or 30, or even older, who have gradually dropped all their educational knowledge and attend school again to learn, in some cases, how to read and write and do simple sums in arithmetic.

Above these Preparatory Courses are what may be called Junior Courses, normally for boys and girls from 14 to 16, in which subjects of general education are continued, though these do not amount to very much, being carried on for only six hours weekly. The Board of Education intends to insist in future on English being continued for boys from 14 to 16, and that arithmetic should always have a place; but in the Junior Industrial Courses there are no definite technical or technological subjects. In the Northern towns the Industrial Courses comprise practical arithmetic and mathematics, instrumental drawing,

a little elementary science, in some cases English, and a little wood or iron work, so that it is really a general education with a very definitely industrial bent.

In the Commercial Courses, shorthand and book-keeping are taken, also English and arithmetic; in the Domestic Courses for girls, besides English and arithmetic, there are cookery, dressmaking and the like.

Speaking generally, these Junior Evening Courses for boys and girls between 14 and 16 should not be and are not of a definitely technological nature; they are really preparatory—to fit boys and girls to take up at 16 some definite trade teaching. Then at 16 and beyond, the courses for boys and girls may be called Senior Courses, being definite Trade [or Industrial] Courses. If a boy is an engineer, he goes on with some mathematics, and also does mechanics and machine drawing; next year he will have the same subjects carried on to a more advanced stage, or he may take up heat engines, motor-car work, or electrical work, or whatever his particular requirement is. Similarly in commercial work, a boy will begin what is called business methods or commercial correspondence and also take up a modern language.

GROUPED COURSES BEST.

Where these Junior and Senior Courses are carried on in the best way, they are grouped, that is, they are carried on about six hours a week, and most of the students are compelled to take the whole Course as laid down. Before 1902, students were allowed to pick their own subjects at Evening Classes; engineering apprentices would take machine drawing and nothing more, or applied mechanics without having the fundamental knowledge for either applied science or mechanics. This was an immense disadvantage, and led to a serious dropping out in perhaps 20 lessons, when students would find they could not go on with the work. They are now required to take definite instruction,—either to take it all or leave it all. Statistics prove that one of the results has been a wonderful improvement in attendance. The boy who takes the necessary fundamental subjects is the one who will get a thorough grounding in his work and can go on to thoroughly advanced work; and as he can grasp it all, he retains interest in his work and stays on, not only during a particular session, but for years, taking three evenings a week.

WORKSHOPS IN SCHOOLS.

There is not much opportunity for shop practice in six hours a week; for a great many trades there is very little workshop practice in the Evening Schools. That has to be gained in the works. All the evening Technical Schools contain workshops, so that if a lad, employed in a large engineering works on one job all day, finds that he is not getting the kind of experience in the works that he needs, he can put in some other nights in the week and get a knowledge of tools and machines that he does not use in the workshop. In addition to

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this, however, he would be expected to take the standard Course laid out by the Board. The boys who attend the Junior and Senior Classes need not be apprentices, but no doubt 90% of them are, and they are all at work. There is no objection to anybody else taking this Course. In a few cases classes are confined to people in the trade on account of trouble between the trades unions and school authorities, but that is not general.

The Junior Course is two years, from 14 to 16, and the Senior Course three years. By the time a boy has attended both Courses, he is 19, and it is probably unnecessary to exercise compulsion on him to continue on his Group Course work. If he has been at all a satisfactory student, he will find it absolutely necessary to reduce the number of subjects studied, for in those advanced stages the study of some particular branch is really sufficient to occupy the evening student's whole time. It is anticipated that students beyond the age of 19 will be allowed to choose their own studies, with the help of the teachers and the school Principal. There are large numbers of students between 20 and 30 years of age.

DRAWBACKS TO COURSE SYSTEM.

One of the great drawbacks in evening technical work is that young men of 19, 20, or even older attend, who have done no educational work at all since leaving the Public Elementary School, and want to have some technical trade instruction, but are not willing to start and go on with the elementary subjects of science and mathematics. Some schools will not take students without being satisfied that they have adequate preliminary instruction; the authorities make other provision for such students. There has been no regulation of the Board of Education making it compulsory that there should be Grouped Courses, but a certain amount of encouragement had been given to that end through additional grants. The Course system did not become general, even in the North of England, until 1903-4, and it is not now fully in operation in the South of England and the Midlands.

CHAPTER IV: CONVERSATION WITH MR. ROBERT BLAIR.

Information obtained in "Conversation" with Mr. ROBERT BLAIR, Chief Education Officer, LONDON COUNTY COUNCIL.

The first landmark of recent times in English education is the Act of 1870. The next is the Act of 1902. These are the two great legislative Acts in modern English education. The former made Elementary Education public and afterwards made it compulsory and free; it established Elementary Education in its present public form, the governing bodies being School Boards; the latter Act gave power to organize Secondary Education, and made County Councils and County Boroughs the authority for education, which was a great change in the character of the authority and also of the powers given to it.

In London up to 1904 there was a School Board which looked after Public Elementary Education, and the Technical Education Board of the County Council which had existed since about 1890, which looked after Technical Education. The Voluntary Schools were not under any common government; but the School Board Schools, and then the Secondary Schools, were all placed under the County Council by the Act of 1903, which made the general Act of 1902 applicable to London, and also made some other modifications for London. In 1904 the London County Council came into power with these three amalgamated powers and also additional power to co-ordinate all forms of education in London. So that the London County Council as local educational authority is concerned not only with Elementary Education, but with Secondary, Technical and University Education. It is not the responsible authority for the University, but it aids the University both on its technical and academic sides to such an extent now, and in future will aid it so much, that it will have a very large influence in University Education in London.

HIGH SOCIAL PURPOSE IN EDUCATION.

The County Council has had only seven years' control of education and the London people think the rates have gone up enormously in that time. Mr. Blair admitted that they had to a certain extent. The whole of the Elementary School system was permeated, he said, with a strong influence of recently developed high social purposes finding scope for its activity in medical inspection, medical treatment, fresh air and greater attention to feeding, cleanliness and future occupation. This social influence has resulted in the organization of what are known as "Care Committees" which have no less than 6,000 voluntary workers. The work has been divided up into three departments as follows:

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(1) *Medical Inspection and Treatment*:—All entrants and leavers of Elementary Schools are medically inspected, and this results in medical treatment every year of 100,000 children, which is about one-sixth of the total. In Mr. Blair's opinion this is bound to have a very important effect on the future of the schools.

(2) *Feeding of Children*:—At the worst periods of the year, 55,000 or 60,000 children are fed at the public expense under all sorts of arrangements.

(3) *Juvenile Labor*:—The Board of Trade is developing Labour Exchanges not only for adults, but for juveniles, and the latter will be connected with the schools.

LONDON'S SCHOOL POPULATION AND SCHOLARSHIPS.

The administrative County of London, which Mr. Blair serves, is not quite the same as what is popularly known as London, the latter being really Greater London, with perhaps seven millions of people. The London County Council is the local education authority, with a statutory commission to promote the general co-ordination of all forms of education within the County area. This administrative County area with its four and three quarter millions represents but a part, though much the larger part, of what is popularly known as London. There is a daily attendance in the Public Elementary Schools of 650,000 children, mostly between 5 and 14 (the years of compulsory attendance).

The Council's annual expenditure on education approaches £6,000,000.

In public or semi-public Secondary Schools (some maintained, some aided, and some not aided by the Council) there are on the roll 30,000 pupils, the nominal leaving age varying from 17 to 19. One important feature about the Secondary Education is that it is not free except to those who by proved ability in the Elementary Schools win scholarships which put them in position to take full advantage of it. These children, about 1,700 boys and girls in equal numbers, are selected every year from the Elementary Schools at 11 or 12 years of age on a basis of examination modified by reports of head teachers which involve school records. The teachers' reports are specially useful at the tail of the 1,700 when it is a question whether a boy should be in or out. The scholarships give them five years for Secondary Education, all they have to do being to satisfy normal conditions year by year in order to continue. A scholarship means not only exemption from fees but maintenance which enables the parent to go without the child's wages. There are about 8,000 such pupils in the Secondary Schools.

On the top of that, towards the close of 16 or 17 years of age, intermediate scholarships enable a child to stay on till 18 or 19, these scholarships being of better value, but fewer in number, about 300 a year, the total number of scholars now being about 690.

On the top of this another system of scholarships takes boys and girls to institutions of University rank, such as Oxford, Cambridge, University College (London), Imperial College of Science and Technology, etc., there being no limit to the institution except that it shall be of University rank. These schol-

arships may not be worth more than £90, and may be down to anything, but as a rule they are made equal to about £150 for a boy at Oxford or Cambridge, or £130 for a woman. They are worth a little less at London where the Colleges are not residential.

FREE SECONDARY AND TECHNICAL EDUCATION.

Secondary and Higher Technical Education and ordinary University Education are thus being really made free to all those who can make first-class use of them; and the Council is giving such maintenance scholarships as enable the poorest boy or girl to be put on a footing at the University with the ordinary student, in regard to clubs and games, etc.

There has to be a declaration of lack of means; all that is investigated and there are certain limits of income all the way through. The Seniors, that is those for the University, are not selected on examination at all, but on record; Juniors and Intermediates on examination.

Attending the Secondary Schools, with the 8,000 or 9,000 who obtain scholarships, are other scholars who do not possess scholarships. The endeavour is to avoid invidious social or other distinctions, though Mr. Blair was afraid the effort had not been quite successful.

The County Council says to these junior scholars: "These are the approved schools, fit yourselves in". The parents make the selection of the school. A scholarship enables a boy or girl from whatever home he comes, to get the very best education available.

SOCIAL GRADES DISCOURAGED.

Asked as to whether these scholarship students were segregated in a class by themselves, Mr. Blair replied that one might say "Yes" or "No" to the question. They were not segregated because they had scholarships though it might be that segregation prevailed to an extent. The idea has been to try and mix the two together, hoping that the scholar of lower social grade would learn something from the higher social grade and that he would also bring something into the school that the other fellows could learn from. The Council had done all it could to obliterate distinctions, and if they thought that a school fostered a social class that kept by itself in that way, they would strike the school off the approved list. But a Secondary School might want to classify in Latin or French—a subject that had not been taught in the Elementary School—and they might put these scholars in a Latin class by themselves and intensify the teaching of Latin for a time. The idea of the Council was that the "scholarship" element should get lost in the school, but the difficulty is that the boy does not always mix successfully.

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THREE CLASSES OF SCHOOLS.

In the organization of Secondary Education in London, there are three classes—aided, non-aided, and ordinary. There are twenty of the Council's own Schools; another set, classified as Aided Schools, to which the Council gives £80,000 a year in Grants; then Non-aided schools, such as the Merchant Taylors', St. Paul's, and the Girls' Public Day School Company. On the Technical side there are also maintained schools; Technical Institutes, Schools of Art, etc.; also aided schools, such as the Polytechnics and the Schools of the University, including the Imperial College of Science and Technology which the Council aids with £8,000 a year, and which is increasing. There are not many non-aided Technical Schools; nearly all belong to the class of maintained or aided schools, the aid given to Technical Schools being about £80,000 a year.

As a rule, aided schools, Secondary and Technical Schools which receive grants from the County Council, also receive aid from the Board of Education; the aided schools and also the Council's own maintained schools get grants from that Board. The non-aided schools do not get grants either from the Board or Council, because they want to stand quite free. Mr. Blair thought it a very good thing for London to have the non-aided, the aided and the maintained schools working side by side. He thought it would be quite a mistake to try to make the whole thing of one common shape all over London; it was far better to let those two or three different kinds live alongside each other, as one set of schools could learn a great deal from the others. The maintained schools are probably better off in respect to all material provisions.

EVENING AND TRADE SCHOOLS.

In the Evening Schools there are about 160,000 students belonging to all kinds of occupations, over 40% being females. No one can understand the system of Technical Education in England who has not fully grasped the meaning of the Evening School work. In these Evening Schools are to be found those students who have felt most the need of education, those who are prepared to make the greatest sacrifices for it, and consequently those who gain most benefit from it. The efficiency of the system is, however, limited by the exhaustion of the long day's toil before the Evening School begins, but the best of this Evening School work cannot be beaten. There are also some 20,000 pupils (11 to 15 years of age) in some 60 schools of a higher primary character called Central Schools. Each of these schools has an industrial or commercial bias.

As to Technical Education, the biggest Technical Schools excepting the Imperial College, are the Polytechnics. On their governing bodies are men who conduct industrial establishments. Mr. Blair admitted that the Council was not nearly as well related as it should be to industry and commerce, but this feature is being developed through so-called Trade Schools, which furnish a substitute more or less for indentured apprenticeship which has broken down. In London everything is differentiated: there is enormous competition

and sub-division so that a man does not make a chair but chair legs, and perhaps not even all the work on them: and while he acquires extreme skill in the making of chair legs, if anything happens to dislocate the furniture industry he is done; having been making chair legs all his days, he cannot make a tin can. What is required is character and a sort of genius for adaptability, so that if he is turned off chair legs he will be able to make tin cans. London is trying to do that by modifying largely the old-fashioned curriculum of the ordinary school, giving it a commercial or an industrial bias.

At the top of the elementary system are the 60 Central Schools which collect the children from various Elementary Schools at the age of 11 to 15 and give them an education with industrial or commercial colour or bias. Then there are the Trade Schools [mostly trade preparatory schools] for boys and girls, these, with one exception, being the product of the last five or six years. All teachers, except those who give mathematics or English, are trade teachers; the Committee is made up of the best trade experts that can be procured; and the boys turned out of these schools find places almost immediately in the trade or industry concerned. These Trade Schools have been established for those who have not yet entered upon an industrial career, but who are prepared to give an undertaking to enter specific skilled occupations at or about 16 years of age. The output of these schools must not exceed the industrial demand. That is not yet large, but there is a notable increase on the women's side. It will, however, take some years for recognition of the value of the Trade School training to secure a firm hold on employers generally.

TRADE CLASSES AND TRADES UNIONS.

In Evening Schools the trade classes are open only to those in the trade—workmen or apprentices—and that is really an agreement with the trades unions; that is, only a bricklayer can join a bricklayers' class; the ironmonger's man is not allowed to join the plumbers' class, etc. If a man wants some training in woodwork, but is not a carpenter, he cannot join the carpenters' class, but is put in the Manual Training class, where there is just woodworking with tools. For 10 or 15 years the Council has had very little trouble with trades unions. It does not matter whether a pupil belongs to the union, but he must be in the trade. The Council judges from investigation how many the trade can absorb, and trains them in that trade for local absorption. The Council would not take the stand that it was not right to train them for other places, say the colonies, because of the expense to London itself; on the contrary, they would be very glad if a boy were able to become a silversmith in Toronto, for example. As a rule however, the boys have no thought of getting places anywhere except near home. These classes are only 5 or 6 years in existence, and are just developing, hence care must be taken that the boys trained are placed, so that parents will have faith in the schools.

The London Trade schools vary considerably in their objective and in the character of the work done. Those for boys are of two kinds: (a) Preparatory Schools for allied groups of trades, *e.g.*, woodworking, engineering, building

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trade, book production; and (b) those training for particular trades, *e.g.*, silver-smithing, tailoring, cooks (men), and bakery. The girls' Schools all aim at providing preparation for particular trades, *viz.*, dressmaking, retail and wholesale ladies' tailoring, waistcoat-making, millinery, corset-making, upholstery, laundry, cooks (women), embroidery, and photography.

For those who can secure a half-day or two half-days per week of "time off" from their daily employment "part-time" classes are provided.

CONSULTATIVE COMMITTEES FOR TRADE SCHOOLS.

The success of the schools is largely attributable to two salient features of the system;

(1) The thoroughness of the investigation which is made into the conditions of a trade before seeking to establish a school or a class. Information is collected by the organizer by personal visits to employers of every kind in each industry; workrooms are seen and foremen and workers as well as heads of firms are consulted. The inquiry is in fact pursued exhaustively until the organizer has a full understanding of the existing conditions of the trade, the likelihood of their permanence (geographically or otherwise), and the kind of skill that modern industry and modern social life are demanding. Every possible step is taken to make co-operation with employers a reality.

(2) The appointment of Consultative Committees of experts. The functions of these committees are solely advisory. They advise in the selection of the trade teachers; in the apparatus and scale of the operations. Either singly or collectively, they visit the schools, inspect the work, offer criticism on the work of the students in their presence, and do not spare them praise or blame according to their merits. In this way the school and the trade meet on common ground and each learns from the other. The members are chosen not only for their knowledge of the trade, but also because of their interest in the social uplifting of the workers. The composite nature of the membership of these committees has been one of their great values. Formed as they are of representatives of the Masters' and Workmen's Associations, members of City Companies connected with the craft concerned, members of important arts and crafts organizations, and of those engaged in the distributing trades, the bringing together of such men, holding as they often do divergent views on art and technical training, yet keenly interested in its advancement, has resulted in an interchange of ideas and an appreciation of ideals which have frequently been productive of most useful suggestions for the development of the work. On the one hand there are among them those who contend that the training should be entirely utilitarian, and that the classes should merely provide such training as cannot be given in the workshop, or as may be required to meet the demand of the fashion of the day. On the other hand there are those who represent the æsthetic side, who are equally insistent on the primary importance of training in the traditional styles of art, and a knowledge of the history of the crafts concerned; on the necessity for training students to apprehend wherein beauty exists; and the fostering and encouraging of individual expression of ideas. These urge that the schools should not only aim at training highly competent workmen, but

should also be a means of cultivating a taste for beauty, and of diffusing a sound knowledge of craftsmanship, and of thus becoming a lever by which the general standard of æsthetic taste, not only of the worker but also of the distributor and the purchaser, may be slowly but surely lifted. The interchange of ideas thus rendered possible by these meetings not infrequently results in the recognition of the value of technical training from both these points of view, and of the formulations of proposals for securing these ends.

BOYS' TRADE PREPARATORY SCHOOLS.

The object of all the boys' schools is to prepare boys to become intelligent workmen, with a fair chance of occupying later on the better paid positions. The schools do preparatory work for which there is no time under modern workshop conditions, and send into the shops youths who have been taught to use hands and brains, and who will be in a position to make the utmost use of that experience which the workshop alone can give. The whole school atmosphere should be creative of a pride in workmanship and of faith in the power and value of the craftsman.

The general education given should, broadly speaking, spring out of and be related to the trade instruction. It should induce the reading sense, so that students may independently seek information related to their crafts or trades. It should also seek to develop, at all events in the better students, the critical attitude towards quality of workmanship, the general life and thought of the craft or trade, and especially the industrial and social conditions under which the craftsmen live and work. Art is in one way easily related. The silversmithing boy or the young architect will draw objects or examples of the goldsmiths' or silversmiths' or architects' work. But the relation must be carried further whatever the object, *e.g.*, if a chalice, its purpose should be described and some time devoted (with examples or sketches) to showing how its fashion has followed the art of the times, and so on.

Mathematics is not treated too ambitiously. A few fundamental principles well driven home are considered worth a hundred tricks. The science master who cannot show at once how much and why his curriculum differs from what he would propose for an ordinary Higher Primary or Lower Secondary School is regarded as misplaced.

The work in history and literature should give the best of the students the historical sense which will enable them to appreciate the part their craft or industry is playing in the development of civilization, and should induce them to explore the masterpieces of history and literature where the great craftsmen have so often found inspiration for their work.

Teachers of sufficient interest, originality, persistence, and sufficiently capable of applying the ordinary subjects of the curricula to each new trade included in a school's objective are by no means readily found; and this difficulty is an additional reason for the slow development of the system.

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HOW TIME IS APPORTIONED.

School-time is apportioned about as follows:—

In furniture trades workshop instruction, including workshop drawing, occupies in the first, second, and third years of the course, roughly one third, one-half and two-thirds respectively. Of the remaining time, one-half is devoted to instruction in science, mathematics, and art, and one-half to English. In engineering schools about one-quarter of the whole time is spent in the workshops; about one-half to instruction in related subjects, such as drawing, mechanics, and mathematics, and less than one-sixth to English. In the School of Building (Brixton) boys taking the trade course, as distinct from the professional course, spend rather more time in the workshop, but in no case does the time spent in the workshop exceed half the school time.

The School of Bakery at the Borough Polytechnic is in the main attended by the sons of Master Bakers.

The last of the schools to be established is a school for boy cooks. The work of this school is guided by an advisory committee of expert chefs. The object of the school is to instruct youths who desire to become professional cooks and to train them by scientific methods in all branches pertaining to cookery and the making of pastry and confectionery. The kitchen is fitted up like the kitchen of a good hotel. The course of instruction lasts for three years.

The Beaufoy Institute gives rather more time to English and general subjects and rather less to science, mathematics, and drawing, as the boys are younger than in the other schools. In the Schools of Artistic Crafts between 9 and 10 hours a week are devoted to drawing and modelling. The artistic craft schools and the school for boy cooks stand in a somewhat different position from others, for in these occupations craftsmanship counts for more than in heavier trades, and a case can be made out for the devotion of rather more time to workshop practice.

A more detailed description of the work of one of the schools will serve to illustrate the nature of the work. (See School of Building, Brixton).

GIRLS TRADE PREPARATORY SCHOOLS.

There are six day Trade Schools for girls in London. In addition trade training is given in three schools for physically handicapped girls.

These schools provide instruction in eleven different skilled trades which afford opportunity for efficient women workers to rise to positions of responsibility, which have been found to require a constant recruiting of skilled workers, while affording within themselves insufficient means of training young workers, and which lend themselves to class teaching.

The task of a Trade School for girls is not merely to teach the manual skill required in the trade workroom, but to supervise the development of the young worker both in health, trade knowledge, and character, so that she may be fit to hold her own in the industrial world.

DESCRIPTION OF BLOOMSBURY SCHOOL.

A description of the work of one of the Trade Schools (Bloomsbury) will give an idea of what is being attempted. The classes range from 16 to 20 in number. The school hours are from 9-5, Saturdays being free. Four needle trades are taught, viz., dressmaking, ladies' tailoring, corset-making and lingerie, and millinery. Photography is also taught. The course lasts two years. A girl can in this time only be trained for one trade. The age of admission is from 14-16. Girls enter either by scholarship, by award of free places, or by paying a fee of 30s. a year.

Of 170 girls attending about half are promoted scholars, and the rest fee-payers. No girl is admitted who does not undertake to stay two years and to enter the trade at the end of the course. The school authorities reserve the right to exclude any girl who proves incapable of attaining a certain standard of efficiency, or to change her trade if advisable. The first three months is a probationary period during which the pupil is carefully watched, and her suitability for the trade she has chosen is gauged. The importance of a right selection of trade cannot be over-estimated, and the school serves a useful purpose in selecting, as well as in training, girls for the work best suited to their capacity.

The trade teaching is in the hands of teachers who have obtained their knowledge of the trade in first-class business houses. As far as possible in a classroom, workroom conditions are set up. The equipment and arrangement of the room is similar to that of a trade workroom. Workroom methods and trade standards of work are adopted, except that whereas in a workroom many combine to produce one article, in a classroom each girl is responsible for and required to carry through all the processes of the article she makes. Very little formal work is done; as far as possible all completed work is real work made for a particular purpose. A record is kept of the trade work of each girl and of the time spent in producing it. Throughout the course, each girl is made to bear in mind that she must in the end have a market value, and for the credit of the school this must not be below the average agreed upon. It is recognized that speed must be combined with skill if the latter is to command a price.

The trade school is kept in as close connection with the trades as possible—members of the trades visit the school, inspect and criticise the work of the girls in their presence, and do not spare them praise or blame according to their merits. The connection with the trades is becoming closer as the school becomes more firmly established, and the girls who pass through the school pass into the trade workrooms.

About two-thirds of the school time is devoted to trade work, the remainder being given to art and general education.

The art teaching, English literature, industrial history, composition, arithmetic, and hygiene lessons which, together with physical exercises and singing, fill the rest of the school time, are all arranged as far as possible to supplement the trade training. The literature lessons are aimed at awakening a love of

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wholesome reading, the history at making clear the system of which the industrial worker forms part. Composition lessons include business correspondence, and arithmetic lessons deal with workroom problems. Hygiene lessons are aimed at being of a practical work-a-day kind, dealing in the knowledge of personal and public health, which should be familiar to the worker.

SECURING POSITIONS FOR GIRLS.

Careful records are kept of each girl's antecedents, her progress through the trade school, her physical condition and development, and her subsequent career. After she leaves every effort is made to keep in touch with her and, with very few exceptions (*e.g.*, girls who have moved away from London), the lady superintendent of the school is able still to watch the fortunes of her old girls. An old girls' club flourishes, which meets at the school. Arrangements are made for the senior girls to be present at old girls' meetings, in order that they may learn direct from their former schoolfellows what the work-a-day world is like.

All firms applying are visited by the trade teacher, who, in consultation with the lady superintendent, picks out the girl she considers suitable for the vacancy, and offers her at the wage she is judged to be worth. It is found that a girl's career depends greatly on her making a successful start in her first place. The experience of the trade teachers proves invaluable both in judging of the suitability of the places found and in helping the girls to meet difficulties and discouragements they may first encounter in the workroom.

The trade school course enables girls to enter the trade workrooms as junior assistants; thus stepping over the earlier stages of apprentice and improver.

Each year it is proving more easy to find places for the girls and a larger field of employers are anxious to engage them. The initial wage tends to rise. The first years that girls were placed out, 8s. or 10s. was the average. This year 12s. and 14s. have been received in many cases.

Girls who have passed through the school appear to have no difficulty in keeping in steady work and in getting promotion. They are favourably commented on both for their workmanship, good manners and reliability, and in cases, where several have worked together, for the improvement in the tone of the workroom. In many cases they have encountered jealousy, but in very few have they been unable to live this down. Employers who have had trade school girls send back for more. In several cases this year girls have left the trade school to work under their former schoolfellows, now promoted to be first or second hands.

It was found in the first years of the trade school that not a few girls after leaving the school broke down in health in the strain of the workroom. Increased care is given to physical fitness. All girls are examined on entry, and re-examined at intervals during their trade school career. Parents are required to get carried out necessary treatment advised by the school doctor. Eyes, teeth, crooked backs, &c., are attended to and opportunities for remedial exercises are given in school. The improvement in physical well-being of

the girls during their sojourn at the school is very marked. The school aims at keeping in touch both with the elementary and other schools from which the pupils are drawn, and also with the parents of the girls themselves. Two or three times a year an open day is held for head mistresses and other teachers who are invited to bring intending pupils, as well as for the parents and friends of the girls. Exhibitions of work to which the trade are invited are also held annually.

COST OF GIRLS' TRADE SCHOOL.

The L.C.C. Trade School for Girls, Bloomsbury, for the session, 1909-10 (173 students), cost per head, gross £21.2s.6d.; net, £14.8s., as follows:—

RECEIPTS.		EXPENDITURE.	
	£		£
Sale of materials.....	164	Equipment.....	29
Fees.....	63	Materials.....	523
Stock in hand (estimated).....	160	Salaries.....	1,829
Grant (estimated).....	685	Other expenses.....	79
		Scholarships (85).....	876
		Establishment charges (not including loan charges on buildings).....	318
	<hr/> £1,072 <hr/>		<hr/> £3,654 <hr/>

POLYTECHNICS TOO BIG FOR EFFICIENCY.

Mr. Blair's view is that the big Polytechnics have become just a little too big, and if they contain Schools of Engineering, Printing, Bookbinding, Building, etc., he thinks the interests of one school often have to give way to the interests of the whole, and that it is really better to have those schools taken out and managed separately. The Principal of a Monotechnic drives his school harder than can a Polytechnic Principal, yet the latter is the one who ought to push what Mr. Blair calls the commercial-traveller work between the schools and the firms, so as to have the two related. He believes that even the Universities are now trying to push a closer relationship with commerce and industry, and probably before long there will be a Bureau established in London with a man whose business it will be to see what is going on in all the industries.

LONDON COUNTY COUNCIL ORGANIZATION.

Mr. Blair gave an interesting sketch of the London County Council's organization for education.

The Council has 137 members, with Committees on Education, Finance, Highways, etc.; Education is so big, compared with the rest of the Council's work, that it is one half. The Education Committee consists of 50 members, 38 of whom are members of the Council and 12 are co-opted members—people selected from the outside to represent various phases of education; but the co-opted member is not a member of the Council, and when the Education Committee goes to the Council it is only 38 strong, whereas the Education Committee

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in committee is 50 strong. The Council itself co-opts, on the recommendation of the Education Committee; but the co-opted member has not any powers on the Council. The members of the Council have to stand the racket of the general election, and they have important functions to fill. The Education Committee of 50 members meets once a week, the press and public being present; and its business is conducted more or less like the business of the Council—formal debate, formal management, etc.; in fact if it were not done formally they could never get through it. Then about 10 sub-committees meet every week to deal with Elementary Education, Secondary Education, Books and Appliances, etc. The committees are formed largely of members of the Council, and partly of co-opted members. The sub-committee meeting will last on an average two or three hours. These men are not paid at all. Some people of leisure and some means give twenty and thirty hours per week to the work of education; they like the work, and they devote their whole time to it. There are gains and losses that way. The people who devote their whole leisure to education are educationists. It is a good thing to have men to deal with education finance who are probably directors of banks, railway companies, etc.

It is a mistake when education gets away from life, and gets a place all by itself; it needs to be related to all phases of the community life. Some people in London are very anxious to have an *ad hoc* body specially elected for education. Mr. Blair thought that would be a mistake. The Council is growing so large that it will be like Parliament; but on the estimates every year they can debate any subject they like; and throw their influence on to those subjects. The Education Committee meets in public, but the main work is done in sub-committees, and sections of sub-committees.

The Elementary School has a statutory body of managers, selected partly by the Council and partly by the boroughs of London, of which there are 29 inside the county area. These boroughs have separate powers for certain things, but no power over education except to elect certain managers for individual Elementary Schools. It is not a very happy arrangement.

The numbers on a Board of Managers are usually a multiple of 3 to 9. Their powers in connection with the school are on the whole not large. They call for repairs and for things to be done on the schools. The architect reports on them, and they come through the architect's report to the Building Committee, which looks after the buildings as a whole.

"IMPORTANT WORK OF CARE COMMITTEE

The Care Committee has activities, such as getting the child placed well, looking after the scholarships, and saying "Now, you must do this and that," and and if the children are bad, looking after them. Those Committees are nominated part by the management and part by the Council. Those six Managers nominate two. Managers can nominate another two from the list, and the central Care Committee nominates others.

If a child is neglected the Committee does not bring the child before the Council, but can prosecute before the magistrate in respect to neglect in feeding

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or medical treatment, or being left wandering in the street, or not being clean. There are four kinds of prosecutions that the Board is engaged in almost daily-- for non-attendance at school there are probably 10,000 to 15,000 prosecutions a year, most of them successful, and the school-going habit has become a good one in London now—91% of the roll is present every day in our schools, and in some places it is up to 96 or 97 in Elementary Schools. When you have 91% of your roll in school you have got about to the limit.

Under the Children's Act there may be a prosecution for neglect for want of food, or neglect in allowing the child to run about the streets at night, and so on. Those are not yet very numerous. Under that Act if the Council thinks the parent ought to pay for the child's food, he can be prosecuted for it. First there is a demand made on him, and if not complied with he is prosecuted. Prosecutions have been fairly successful. There is a fixed price for each meal, say 8 meals at 1½d. each, and the bill is sent in for a shilling. If the parent is known to be in good work he is sued for the payment; in case of poverty from illness or other causes the Board meets that without any prosecution. Then the same in regard to medical treatment. For medical treatment there is a charge. The treatment is obtained; sometimes it is pretty costly, but on the average it costs about 5s. per case, and if the Council thinks the parent ought to pay, he is sued. It does not come often. Suing in respect of feeding and medical treatment has been so much labor that one wonders whether the moral effects secured are worth all the trouble, and the Council or Parliament will likely do away with the charge, which is really a block in the way of getting medical treatment.

CHAPTER V: TYPES OF INSTITUTIONS IN LONDON.

SECTION 1: CENTRAL SCHOOLS IN LONDON.

In addition to the Elementary Schools which supply the usual type of general education the London County Council has organized a number of Central Schools with a view to providing for those boys and girls who are to stay at school till over 15 years of age an education which, while being general, will have a commercial or an industrial bias. It is proposed that there should be about 60 such schools, and that they should as far as practicable be distributed uniformly throughout London. The pupils are selected from the ordinary schools when between the ages of 11 and 12, and are chosen partly on the results of a competition for scholarships and partly on the results of interviews with the head-teachers and Managers. A limited number of bursaries or scholarships tenable from the age of 14 to about 15½ are awarded to those pupils who need financial assistance to enable them to stay at school beyond 14. These schools are distinguished from the ordinary Elementary Schools by the fact that the pupils are selected and go through a complete four years course with a special curriculum. They are also distinguished from the Secondary Schools by the fact that they are Public Elementary Schools providing free education, and that the curriculum is framed with a view to enable pupils leaving school at the age of 15 to be in a better position to earn their living. The total number of Central Schools that had been organized up to 1911 was 39. Of these 13 have an industrial bias, 13 a commercial bias, and 13 a bias both industrial and commercial.

The Commission understood that it was the intention, when the Central School scheme is in full operation, to have the schools reserved only for pupils over 11 years of age.

The Commission visited a number of typical Central Schools. The following are notes of some of the features suggestive or instructive for Canada:—

WEST SQUARE CENTRAL SCHOOL.

This is a school for boys and girls. It is a centre with an industrial bias. About half of the whole time was given to practical or manipulative work, including Drawing. Out of 10 sessions per week 1½ were devoted to work at benches in the workshop. The bench work was with wood only. The Principal of the school would prefer wood-working during two years, and then wood and ironworking concurrently during two years.

The courses of study are grouped under several divisions, namely, Industrial History, Economic Geography, English, Mathematics, Handicrafts, Drawing. These are all closely correlated. For example, in the wood-working department the boys make the apparatus required in the science laboratory. The school is situated in a working district and is specialized towards industrial life. Other Central Schools at the differentiation period give both commercial and industrial instruction. This school leaves out the commercial. The Commission received a volume containing a statement of the schemes of work in detail, and illustrated by the pupils. It is a matter of some regret that space cannot be found for a representation of this document. Several hundred drawings illustrate the general syllabus for science, handicrafts and drawing.

INDUSTRIAL HISTORY.

In the division of Industrial History, the following brief statements are given as illustrations of the syllabus:—

First year's Course: General Scheme: Outlines of general history 1066—1485, with special reference to the Doomsday Book and the Feudal system; origin and growth of towns and guilds; economic effects of the Feudal system; agriculture, the principal industries, manufactures and trades, England's monopoly of wool, the effect of the Crusades on foreign trade; the Black Death and its economic results; the Peasants revolt of 1381, and the subsequent conditions of the people at the close of the Middle Ages, 1472.

Then follow details of the syllabus and the mention of reference books.

Second year's Course: General Scheme: Outlines of general history 1485-1689 with special reference to trade and industries and the conditions under which the people lived; the conditions prevailing at the close of the Middle Ages and the great changes arising from the Wars of the Roses; the rapid growth of foreign trade owing to colonization; the increase of the mercantile classes and the revival of learning.

Then follow detailed particulars with mention of reference books.

Third year's Course: General Scheme: Outlines of general history 1689-1820, with reference to the "Bloodless Revolution" and its effects on industry and trade; the rising power of the Trading Classes; the acquisition of colonies and dependencies and the expansion of foreign and colonial trade; the transition from the domestic system of industry to the establishment of factories; the age of inventions.

Then follow detailed particulars with mention of reference books.

Fourth year's Course: General Scheme: Outlines of general history 1820 to the present time, with special reference to the industrial progress of the nation; the improved means of transit internally and with colonial and foreign ports; introduction of penny postage and the electric telegraph; the growing power of the industrial classes and organization; the general reform of social conditions; local government and extension of self government to the colonies.

Then follow details of the syllabus with mention of books for reference.

DRAWING.

In the division of drawing, free drawing and mechanical drawing are carried on concurrently during the whole of the four years. Free drawing from nature in the form of stems, leaves, flowers and shells goes practically hand in hand with mechanical drawing. In the fourth year the free drawing takes up the application of the forms of stems, leaves, flowers and shells to simple design, while the mechanical drawing goes as far as simple mechanical drawing as applied to machine construction, with Isometric drawing as applied to technical work.

A serious effort is made to shape the instruction so as to qualify the boys for the industrial life of the district. No attempt is made to qualify them

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directly for the trades, but rather to give them a degree of familiarity with tools in general, besides the scientific elementary principles applicable to all trades.

Similarly girls are trained so as to be fitted for home-life. The girls' courses cover cooking, laundry, housewifery or house-keeping, dressmaking, needlework, or embroidery, and preparation was being made for the introduction of millinery.

CHILDERLEY STREET SCHOOL.

A detailed course of study was also obtained from the Childerley Street Central School. It is somewhat different from that of West Square Central School, and was framed to meet the conditions of working and living in its area.

At the Childerley Street School the children are drawn from 17 other schools between the ages of 11 and 12. The Commission was impressed by the evident interest of the boys and girls in their work. As a case in point, upon entering a drawing room where 25 boys were at work, instead of the presence of the Commission creating distraction there was only a casual glance of observation, then every boy went intently on with his work.

OTHER CENTRAL SCHOOLS.

Other Central Schools were visited. A volume would be required to contain particulars regarding all the good work carried on at them. The Commission was impressed by the enthusiasm, native ability, alertness and educational experience of the Headmasters and the Headmistresses.

Physical drill and music were in evidence, with boys singing what appeared to be difficult music in excellent harmony. Boys between 9 and 10 drilled with a precision of movement that was quite remarkable. In the physical drill of the girls more attention was directed towards grace of movement as illustrated in simple dances.

From one of the Central Schools it is reported that 70% of the boys enter industrial work. The Headmasters are in touch with employers and do their best to place every boy in a situation on the completion of his course.

SECTION 2: CENTRAL SCHOOLS—EVENING WORK.

HUGH MYDDELTON SCHOOL (Clerkenwell).

At this school classes are held every evening except Saturday, attended by 400 to 500 students. The building is also used for social meetings, concerts, boys' brigade, and for Sunday School.

The Subjects covered in the Evening Classes are Mathematics, Book-keeping, Commercial subjects, English, French, German, Irish, Latin, History, Italian, Spanish, Welsh, Shorthand, Typewriting, Business Management, Economics, Art, Art (Teachers' Class), and Literature Lectures.

Organized courses of study are arranged, and pupils strongly urged to take a complete course instead of isolated subjects. No student under 18 is enrolled except for a complete course.

The teachers receive 7s.6d. per evening for ordinary subjects, 10s. 6d. for Languages, Law, and more advanced subjects. Some of them teach day classes under the London County Council; others are in business during the day.

There are no fixed entrance conditions, age and suitability being the only tests.

The School does nothing directly to find employment for pupils, but its certificate is a help to securing work. Chamber of Commerce pupils are referred to that body. Masters interest themselves in special cases.

The attendance is largely affected by overtime work.

The fees are small, being 2s.6d. a session for students over 16; 1s.6d. for those under 16, for one or more subjects; a charge of 5s. and 2s. 6d. respectively being made for Art. Fees may be remitted in special cases.

Pupils are prepared for various public examinations, the Civil Service, etc.

BARRETT STREET EVENING COMMERCIAL SCHOOL, (OXFORD STREET, LONDON, W.)

This School has an average attendance of 250 pupils a night for 5 nights a week from September to Christmas; after Christmas, 200. It originated under the old School Board, at the request of employers, some of whom had previously subsidized commercial classes. It has been in existence about 10 years, and is supported by grants from the London County Council and by fees, the latter being merely nominal, viz. 2s. 6d. per session for pupils over 16 and 1s. 6d. for those under that age.

The School is self-contained. The entrance requirement is the 7th Standard of an Elementary School. The staff prepare the curriculum to meet the needs of the neighbourhood, which is the central shopping district, occupied by large drapery and furniture establishments. The employers of the district encourage their employes to attend. The majority of the students are engaged in stores and offices, banks, etc., their ages being 20 to 30. The teachers are drawn from men engaged in office work, the instruction being entirely of a commercial nature. Each teacher is a specialist in his own department. The head of the establishment is an Elementary School teacher, and prepares the curricula after conference with the staff. Textbooks are furnished to the students by the L.C.C. at the lowest possible prices, and stationery is provided free.

The building is used as an Elementary Day School, and the equipment is supplemented for Evening Classes by special desks and seats. The caretaker is paid extra for evening work.

The teachers receive from 7s. 6d. to 10s. 6d. per night, according to subject, teaching $2\frac{3}{4}$ hours each night. Teachers must hold recognized certificates.

Students may compete with other London schools for 10 scholarships, tenable at the London School of Economics. The L.C.C. also give prizes in

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the form of books. At the time of the Commission's visit there were 400 entrants for examination, of whom the responsible master expected three-quarters to pass.

The lessons are adapted to the requirements of students; Shorthand, Languages, etc., being given in the phraseology of the student's business. There is a Russian class for employes of firms doing business with Russia. One new subject is added each year. In 1910-11 English classes for foreigners were established.

The Vocal Class is affiliated with the Night School Choral Union, the music being supplied at cheap rates by the L.C.C.

WILLIAM STREET SCIENCE AND ART AND COMMERCIAL CENTRE (LONDON, W.)

This school has Evening Classes. It is also under the L.C.C., and run on similar lines to the foregoing. The district being chiefly commercial, the instruction is given on these lines. Teachers' Classes are held in Art, Care of Children, etc., for teachers living near by.

The school aims to carry on the work begun in the ordinary Evening Schools of the district, and to prepare for Polytechnics and Art Schools; also for Teachers' Certificates in the Sections of Art, Science, First Aid, Home Nursing and Infant Care.

The Courses of Study are commercial and literary, students being urged to take complete courses, and those under 18 are obliged to do so.

The teachers are trained and certificated, and usually specially qualified. The Art instructors are teachers from the Council Day Schools. For special subjects such as languages, specially qualified people are chosen, not necessarily trained teachers—*e.g.*, a barrister lectures on Commercial Law, a doctor on First Aid, etc. The Shorthand teacher holds a gold medal for highest speed in Pitman's shorthand competition. The responsible master's salary is fixed; the other teachers are paid by the lesson.

The entrance requirement is a good general education, students under 16 being taken only if their previous training is adequate.

A few social gatherings, dances, etc., are held during the session.

The fee is 2s. 6d. per session, 1s. 6d. for pupils under 18.

SECTION 3: BOROUGH POLYTECHNIC INSTITUTE.

There are 3,000 students in attendance; 4,000 students and members used the building last year. The neighbourhood (Borough Road) is one of the poorest in London.

Boys must have passed the 6th standard (about 12 years of age); but half of them cannot read a passage in any standard author such as Scott, Dickens, etc., and understand it. This is because of the large classes and largely mechanical teaching. Here history and geography are taught industrially—work and wages; literature as taught means not grammatical analysis but a love of

literature—ability to grasp the story. Language is taught by the direct method—phonetics.

Principal Millis expressed the opinion that there is a good deal in the atmosphere of the school in which a boy works, and this atmosphere is governed largely by the equipment and by the style of the men under whom he works. As boys are leaving, these men, who have worked in shops and have scientific knowledge applicable to the trade, can talk in a general way and plan out the work, and use influence outside in getting boys into work. There are various ways in which a piece of metal can be worked, and a boy at once gains the sympathy of men in the shop and inspires confidence in employers and firms by the way he handles metal, and the method he shows in the work. About the age of 16 boys go into occupations by various conditions—physique, deftness for mathematical instruments, etc.

PLACING BOYS AND GIRLS.

Mr. Millis stated that it was difficult to get boys into employment, due to the fact that the employers could get boys from the Elementary School. No boys were admitted to this Polytechnic unless they intended to take the full three years' course and afterwards follow some mechanical or industrial pursuit. At the end of that course a list of the boys who are leaving is sent out to various firms engaged in those trades for which the boys are trained, giving particulars of each boy's work, both theoretical and practical, with remarks as to his general character. An Advisory Committee connected with each trade acts with the object of linking up the education given in the school with the industrial activities of the neighbourhood. Of the 30 boys who left the day school in July, 1910, 16 obtained employment directly through the school influence; 2 went to Technical Colleges, and the remainder found work either through the influence of their parents or by the help of other agencies such as District Apprenticeship Committees.

In the Girls' School they have Waistcoat-making, Ladies' Tailoring, Dress-making, Upholstering, and Laundry. Girls come at age 14 to 16; 20 hours out of the 30 are devoted to actual trade work; the other 10 hours for general education, Physical Drill, History, Drawing and Art. Girls are employed at high wages before their time is up. Girls' trades are not so highly organized, and the employers are wanting them. The aim is to give a good all-round training. Girls get an average of 8s. to 10s. and sometimes 10s. to 17s. a week.

Girls are not trained here for domestic service, but the intention is to train young women as first-class cooks. Mr. Millis believes the cure of snobbishness which leads girls into clerking and as ordinary English typists, is to be found in the trade classes.

SOCIAL VALUE OF THESE SCHOOLS.

Principal Millis, who has been in educational work for 33 years, thinks that many of our social problems will be cured by having Trade Classes from which properly trained young people can be sent into every trade. He also

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believes that the educational work of the Technical Institute, whether Trade or Evening School, is one of the greatest temperance organizations to be found, without saying one word about temperance. On these grounds alone they are worth all the money that is spent on them, for it is known that all the pupils will be better men and women. The workers and people connected with temperance organizations know that the changes have been enormous amongst the actual workmen; they are much more temperate. These schools get the more thoughtful people in all the trades; people see that the man who works with his hands is as "good" as the one who works with his pen. The improvement in physique has been marvellous; hence social conditions are being improved.

AIM OF THIS INSTITUTE.

The Borough Polytechnic was founded in 1892 to provide, in the first place, sound technical instruction for young men and women engaged in various trades and industries in the district of Central South London. It must be specially noted that this instruction is designed, not to *supersede*, but to *supplement*, the training of the workshop or other place of business.

The secondary object of the Institute is to promote general knowledge by means of classes in arts and crafts, higher commercial subjects, languages, domestic economy, music, etc.

Lastly, the Institute does much to facilitate social intercourse amongst its students. Membership of the Institute carries with it certain privileges, and healthy recreation and amusement is afforded by its various Clubs and Societies.

The income of the Institute is chiefly derived from grants made by the following bodies:—London County Council, Board of Education, Central Governing Body, Governors of Herold's Foundation, Trustees of St. Mary Newington, National Association of Master Bakers and Confectioners, London Master Bakers' Protection Society, and Trustees of St. Olave and St. John, Southwark.

Day and Evening Classes.

The work of the Institute is divided into two branches: (1) Day Schools and Classes, (2) Evening Classes.

Day Schools and Classes.—Under this head are comprised—

1. Trade School for Girls to teach a skilled trade (Waistcoat-making, Ladies' Tailoring, Dressmaking, Upholstery, or Laundry work), and to continue General Education; two years course; age 14 to 16.
2. Domestic Economy School for Girls (Cookery, Needlework, Laundry-work, Housewifery, Drawing, and Physical Exercises.)
3. Technical Day School for Boys (Mechanical Drawing, Chemistry, Physics, Use of Wood and Metal-Working Tools, and English subjects).
4. The "National" School of Bakery and Confectionery.
5. Music Classes for Boys and Girls.

Evening Classes.—The following are the main Departments:—

1. Special Trade Classes (for Engineers, Metal Plate Workers, Bricklayers, Masons, Carpenters, Plumbers, Tailors, Boot and Shoe Makers, Printers, Bookbinders, Wheelwrights, Varnish and Colour Makers, Bakers and Confectioners).
2. Engineering and Building Trades Department (Practical Geometry, Machine Construction, Applied Mechanics, Heat Engines, Practical Mathematics, Building Construction, Builders' Quantities, Motor-car Designing and Construction).
3. Chemistry (Organic, Inorganic and Electro-chemistry).
4. Electrical Department (Magnetism and Electricity, Electrotechnics, Electric Lighting, Wiremen's Work, etc.).
5. Other Science Classes (Mathematics, Physiology and Hygiene.)
6. Arts and Crafts (Modelling, Design, etc.).
7. Women's Technical and Domestic Economy Classes (Millinery, Dress-making, Embroidery, Cookery, Needlework, Sick Nursing, etc.).
8. Higher Commercial and General Classes (Languages, Commercial Law, Economics, Banking and Currency, Machinery of Business, Accountancy, etc.).
9. Music and Elocution Classes (Pianoforte, Violin, Singing, Elocution).
10. Special Trade Classes. These are intended only for those actually working at the respective trades, and other students are not admitted.

Students are required to attend the theoretical as well as the practical classes.

In certain Trade Classes (Engineering, Brass-finishing, Pattern-making, etc.) where practical instruction only is given, students are required to attend a Drawing or Mathematics class, to which they are admitted at a reduced fee. No student is admitted to the practical class who does not fulfil this condition.

Students joining Trade Classes are admitted to any of the Science and Art classes at half-fees.

Apprentices and others under 21 years of age are admitted to any particular Trade Class at half fees on production of a letter from their employer or foreman stating that they are actually working at that trade.

This is only one of many Polytechnic Institutes in London, and only the main features of this one are stated here. The announcements of the Courses of Study of these Institutes run to hundreds of pages, and are worthy of study in detail by principals and teachers of Technical Schools and Institutes in Canada.

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SECTION 4: THE NATIONAL SCHOOL OF BAKERY AND CONFECTIONERY.

As an example of a "Specialized School" for a particular trade the following full statement is given of the above named school:—

NAME AND AIM.

The National School of Bakery and Confectionery at the Borough Polytechnic Institute, was established to promote industrial skill in the Bakery trade, and by sound instruction in the scientific principles underlying the trade to raise the status and skill of the worker.

HISTORY.

The School came of small beginnings. A class in bread-making for evening students was started at the Institute in 1904 in a part of the Cookery School fitted up with necessary portable oven and other fittings. The class was inaugurated at a public meeting of the trade, and the first course had an average attendance of 66 students, notwithstanding that it was carried on under great difficulties by reason of the absence of proper accommodation for practical work. The Instructor of the class, Mr. John Blandy, was a well-known master baker who had worked hard and enthusiastically for years in the cause of Technical education for the bakery trade. The one class quickly grew to five classes and the work proved so successful that a special bakery was built in 1898, the cost of the equipment, over £700, being defrayed by a grant from the Technical Education Board of the London County Council. To mark its opening as a special department of the Institute, an influential meeting of over 200 master bakers and others connected with the trade was held. The report of the meeting in the Trade Press attracted a good deal of attention, and the National Association of Master Bakers and Confectioners showed their interest in the work by offering to co-operate with the Governors of the Borough Polytechnic in providing Technical Instruction for those engaged in the trade. As a result of this co-operation the "National" School of Bakery and Confectionery was founded in 1899 with day and evening departments.

FINANCE.

The National Association of Master Bakers and Confectioners contributes up to £500 a year, as required, towards the upkeep of the School; the London Master Bakers' Protection Society has for some years made an annual grant of £50 to the School, and leading firms in the allied trades make gifts in kind to the value of about £200 a year. For the year ending July, 1909, the

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cost of the School, exclusive of establishment charges, heating, &c., was £1,406. The revenue account is as follows:—

Income.

Grants:—	£	s.	d.	£	s.	d.
National Association.....	300	0	0			
London Master Bakers.....	50	0	0			
Gifts and Materials.....	242	6	6			
Governors of the Borough Polytechnic (exclusive of Lighting, Heating, &c.).....	60	0	0			
	<hr/>			652	6	6
Fees.....				402	0	0
Sales, &c.....				286	5	9
London County Council and Van Marken Scholarships.....				71	9	8
Sundries.....				6	4	0
				<hr/>		
				£	1,418	5 11

Expenditure.

	£	s.	d.
Salaries and Wages.....	576	7	6
Class, Materials, Printing, Advertising, &c.....	754	7	6
Special Equipment and Alterations.....	135	10	9
	<hr/>		
	£	1,486	5 9

BUILDINGS.

The special bakery built in 1898 was used for both bread-making and Confectionery, and this was very inconvenient, especially when the number of students began to increase, and in 1902 a further extension was built at a cost of about £3,000 towards which the London County Council made a grant of £1,750, and the National Association of Master Bakers and Confectioners gave £250 and made itself responsible for the equipment of the whole of the new building. This extension gave a new bakery which could be devoted entirely to bread-making, and the existing room was reserved specially for the confectionery side, provision was also made for a lecture room and store room. Under these satisfactory conditions the work continued to flourish and the question of further accommodation became necessary. In 1908 by means of a gift of over £5,000 from Mr. Edric Bayley, and a grant from the London County Council, the Governors were able to make valuable extensions to the buildings, which included the remodelling of the Bakery School accommodation by the erection of a large lecture room and laboratory, and by increasing the accommodation of the bakery and confectionery rooms, the National Association providing the additional equipment. The accommodation possessed by the School is two large rooms for confectionery, one large room for bread-making and an extensive lecture room and laboratory; in addition the students use the classrooms and art rooms of the Polytechnic for their special instruction in Drawing and Modelling. The equipment of the bakery consists of a large draw-plate oven, and a Peel oven in the bread-making room; and in the confectionery a large double decker oven and an extensive collection of all the modern machinery for bread-making and confectionery. There is accommodation and the usual equipment for more than 50 students at one time both in the laboratory and in the bakehouse.

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CURRICULUM AND TIME TABLE.

The full time Day Courses extend over two years and the number of individual Day Students attending for the last three Sessions are as follows:—1908, 54; 1909, 45; 1910, 51.

The instruction which all students must follow, includes Bread-making, Confectionery, Drawing and Modelling, Chemistry and Physics. The Session covers a period of about nine months, and the School is open for 33 hours per week. The fee for the Session is £7 7s.

TIME TABLE.

Elementary.

	9—10.	10—12.30.	2.0—4.0.
Monday.....		Icing and Piping.....	Confectionery.
Tuesday.....	Lecture on Confectionery.....	Bread.....	Bread.
Wednesday.....	Drawing and Modelling.....	Confectionery.....	Icing and Piping.
Thursday.....	Chemistry.....	Physics.....	Small Breads.
Friday.....	Drawing and Modelling.....	Bread.....	Bread.
Saturday.....	Confectionery.....	Confectionery.....	

Advanced.

	9—10.	10—12.30.	2.0—4.0.
Monday.....		Rolls, &c.....	Rolls, &c.
Tuesday.....	Drawing and Modelling.....	Confectionery.....	Confectionery.
Wednesday.....	Applied Chemistry.....	Bread.....	Bread.
Thursday.....	Drawing and Modelling.....	Icing and Piping.....	Confectionery.
Friday.....	Confectionery.....	Marzipan Work.....	Confectionery.
Saturday.....	Bread.....	Bread.....	

From the time table it would appear that very little attention is paid to the scientific side of bread-making, but this is not so, for whilst waiting for the fermentation processes during the time shown for bread-making the necessary Chemistry and Physics required for the technical course and a number of laboratory experiments are carried on: special laboratory note books have been drawn up for this purpose.

Evening Classes in bread-making and confectionery are held at the School, but are not dealt with in this Report. The number of individual students attending the Evening Classes for the past three Sessions is as follows:—

	1908	1909	1910
Evening Students.....	143	121	206

STAFF AND COMMITTEE.

The School is managed by a Committee appointed by the National Association of Master Bakers and Confectioners, the Chairman and Principal of the Polytechnic being *ex officio* members. The Committee superintends the working arrangements of the School and advises the Governors on all important matters connected with the management and equipment of the School, and the appoint-

ment of teachers. The School is staffed by an expert confectioner of wide experience and by an expert in bread-making possessing not only considerable trade experience but a good knowledge of the scientific side of the trade; the services of the Art Master of the Polytechnic are obtained for the Drawing and Modelling.

RESULTS OF TRAINING.

The School being under direct trade management, its work is always kept on trade lines. The students who are mostly master-bakers' sons are able to apply the knowledge they gain in the School in their fathers' businesses, and the few who do require situations have no difficulty in obtaining them.

OPINIONS OF EMPLOYERS.

That the work of the School is appreciated is shown by the fact that its fame has spread to all parts of the world, and a few students have come from Canada, New Zealand, South Africa, and Holland, to attend the classes. The large number of day students is maintained year after year, and demands for lectures from the teachers of the School are frequently received from the provinces. The annual grants from the National Association of Master Bakers and Confectioners and the London Master Bakers' Protection Society may be taken as very conclusive evidence that the work is being carried on to the satisfaction of the trade.

SECTION 5: THE SCHOOL OF BUILDING (BRIXTON).

This school is one of the Monotechnics. It was opened in 1908. The following statement as presented by Mr. R. Blair, Chief Education Officer of London, to the Imperial Education Conference is fuller and better than the notes of the Commission.

(1) The prospectus states that "a Day School for boys has been established at this Institution, with the object of providing a sound scientific and technical training for boys preparing to enter the Building Trades and allied vocations."

Although it has not been suggested that this training should in all cases replace apprenticeship, the instruction given is that which modern conditions render almost impossible save at such an Institution as this. In the case of boys whose parents are able to maintain and pay a premium for them, apprenticeship for a reduced period may follow at the termination of the three years' course. On the other hand, boys of poorer parents entering the trades or becoming draughtsmen, clerks in builders' and surveyors' offices, etc., are at the completion of their course in a position to commence work as apprentices or learners with much more advantage both to themselves and their employers than boys securing such appointments immediately upon leaving the ordinary schools. The whole of the training is preliminary, and should be continued at Evening Classes in the Council's institutes or polytechnics.

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(2) The course is for three years, and admission to the School is restricted to boys between 13 and 15 years of age on the 31st July of the year in which they enter the school and who have passed the sixth standard of an Elementary School or its equivalent.

The curriculum, which is common to all students during the first year, and which is looked upon as a probationary period, includes Building Construction, Workshop Practice, Study of Materials, Workshop Arithmetic and Mathematics, Experimental Science, Geometrical and Plan Drawing and Lettering, Freehand Drawing of Building Details, English Literature, History, with special reference to industrial changes and the development of public and domestic architecture, Geography, with special reference to building materials, English Composition, and Business Correspondence. Briefly this is—

	8	hours per week	Workshop Practice (General);
	6	“	“ Technical and Drawing Office instruction;
10	“	“	English, Mathematics, and Art applied to building;
4	“	“	Elementary Science;
2	“	“	Physical Instruction.

At the end of the first year the Principal advises the parents of the boys attending the School as to the most suitable vocation or craft to select for their sons; this recommendation is based upon any special aptitude shown during the first year; reports from the masters; the character of the boy; and the position of the parents.

In the second and third years the courses are divided into two main sections: (a) the Artisan Course for Bricklayers, Carpenters, Masons, Plumbers, Painters, etc.; (b) the Higher Course for Architects, Builders, and Surveyors. During these two years the instruction in Building Construction for all students is of a more advanced character, and the general Elementary Science with reference to building materials and Mechanics of Building is more directly applied. Pupils taking the Artisan Course specialise in the trade which they intend to follow. The pupils in the Higher Course receive weekly instruction in the various trades in rotation, and Builders' Quantities, Architectural Drawing, and Land Surveying are added to the curriculum.

In the second year—

	10	hours per week	are devoted to the specialised instruction.
	6	“	“ to Technical and Drawing Office work;
	4	“	“ Elementary Science;
	8	“	“ English, Mathematics and Art applied to building;
	2	“	“ Physical Instruction.

In the third year—

	15	hours per week	are devoted to the specialized instruction;
	5	“	“ to Technical and Drawing Office work;
	4	“	“ Science;
	4	“	“ English, Mathematics and Art applied to building;
	2	“	“ Physical Instruction.

(3) Towards the end of the third year, as opportunities arise, the most suitable are placed. Up to the present this has been done particularly satisfactorily direct from the School. The Principal is of opinion that it is undesirable to insist on the completion of the full term of three years, as it would be extremely difficult to place, or assist in placing, say groups of 50 boys leaving simultaneously.

The nature of the School draws students from all over London, and in order to meet the needs of the boys there has been provided a cheap plain midday meal, consisting of hot meat, two vegetables and pudding for which 4d. is charged per boy, and in the case of cold meat, vegetables and pudding, 3½d. per boy.

The workshop instruction is of such a nature as to render frequent bathing a necessity. A range of six shower baths forms part of the school equipment: the great demand for their use is an instance of their necessity, and speaks for their popularity. Personal hygiene is regarded as part of the training towards good citizenship. It is hoped that this love of cleanliness, and generally a high ideal of self-respect, may be continued in after life.

As a protection to clothing, the wearing of white overalls is insisted upon in all workshops.

Finally, wherever the instruction permits, such as in the workshops, drawing offices, etc., the conditions and type of work as nearly as possible approach those obtaining in builders' shops, architects' and surveyors' offices, etc. The instructors for this part of the work are drawn from the ranks of first-class craftsmen who have had broad experience in shops, offices, etc., and who, therefore, are in a position to appreciate the condition prevailing in the commercial work.

CHAPTER VI: TWO IMPERIAL INSTITUTIONS.

SECTION 1: IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY, LONDON.

Information obtained in "Conversation" with SIR ALBERT KEOGH, Rector, SIR EDWARD THORPE, Professors PERRY, CALLENDAR, ROBERTSON, FARMER and MACBRIDE, at the Imperial College of Science and Technology, London.

The Imperial College of Science and Technology consists of three institutions—the old Royal College of Science, the Royal School of Mines, and the City and Guilds Engineering College, formerly known as the Central Technical College. These three institutions were, in a sense, independent of one another. The Royal Colleges of Science and Mines were for many years run by the Education Department, the former having been begun as part of the old Science and Art Department. Four years ago a general feeling existed that these institutions—certainly two of them—were ceasing to fill the objects for which they were founded; that they did not progress with the general spirit of the country, inasmuch as, while they were on rather old lines, the new Provincial institutions and other schools had arisen and had met with a great measure of success. Accordingly a Committee of eminent men engaged in education—some of them the best known names in England—was convened by the Minister of Education, and brought in a report, the general meaning of which was that the relation between Science and the industries in Great Britain had never been very well established; that, as a consequence, industries were falling behind, having lost a great deal of way which they formerly had—the great object-lesson being Germany; and that this Imperial College ought to be founded.

AN IMPERIAL IDEA.

The Imperial part of the idea was to have a College that would provide for the higher scientific objects of the whole Empire. It is a very ambitious project, and if ever realized, must take many years. It was thought that this College should be the centre about which all the great scientific and technical interests of the Empire would revolve. Though some people might consider this a very pious idea which could never be realized, Sir Albert Keogh thought it could, and indications within the past year showed that if the country is alive to its importance, the project can be fulfilled.

The idea was to have a central institution on the very highest scientific plane, to which the rest of the Empire would look, and to which the other institutions of the Empire would send students for special study of particular branches.

The other idea, which was perhaps the more businesslike and satisfactory, was that of binding these three colleges under one governing body and providing

the highest scientific training in the country in relation to industries. The feeling of the Committee, though not perhaps expressed in the Departmental Report, was that the industries of Britain were behind, not because of lack of men and organization, but because it was impossible to get the highest scientific education directed especially towards the requirements of the country's industries. On one hand the universities were training for degrees, and on the other the industries did not want college-bred men. The syllabuses were laid out by persons who had, perhaps, no knowledge of or connection with the industries, and statements were made that the people turned out were utterly useless to the manufacturers. As a broad general principle, industrial people rather fought shy of college-trained men. Sir Albert Keogh thought that this objection applied with less force to the South Kensington institutions than to any others in the country.

The College of Science was originally started mainly for teacher training, but the effect of the Departmental Committee Report was to turn it towards scientific training of individuals who were to become masters of industry.

BUILDINGS AND SCHOOLS.

The Royal College of Science consists of two buildings, one comprising accommodation and equipment for Mechanics, Mathematics, both branches of Biology, and some Metallurgy; the other providing for Chemistry and Physics.

The Engineering School of the Imperial College is the City and Guilds College, in Exhibition Road. The institution is remarkable in that it is the only one in the country to which entrance is competitive. The College is always full, and the number of applicants for admission is in excess of the number of vacancies. The entrance is by examination, which in character is rising in standard. It is probably one of the most successful engineering schools in the country.

The School of Mines, as a consequence of several very considerable donations from people interested in mining and metallurgy, has been partly reorganized and its courses of study improved quite equal to anything done elsewhere. Buildings are now being erected quite worthy of the important object. There has also been considerable increase in the size of the building, this work being under contract. In connection with the School of Mines and the Engineering School the amount being spent is £260,000.

Those are the three institutions of which the Imperial College consists, and the ideal is that the standard of admission into the College be gradually raised, so that only the very highest work will be done within its walls. It is hoped that in fulness of time graduates will come; that the Dominion of Canada will send its graduates to it instead of to Continental Europe for their higher studies. The College is to be developed in accordance with the requirements of Australia, Canada and other parts of the Empire.

ADMISSION AND TRAINING OF STUDENTS.

These institutions now receive boys not younger than 17, who have had a good Secondary Education, and excuse them from the first, second, or third year course in accordance with the standard they may have attained when they present themselves, their fitness to be excused from the early subjects being decided by the professor concerned. Diplomas are given in Mechanics and

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Mathematics, Chemistry and Physics and other sciences, Mining and Metallurgy, and both branches of Biology. The special feature of the institution is that the training is given to the student by the professor in such a manner as the latter thinks best adapted to make this boy of use to the industry. That is where it clashes with the University system. It is an open secret that this College does not quite see eye to eye, for instance, with the University of London; and many have feared that if the College were incorporated by the University, as some propose, the whole of this feature would be destroyed; because mining and mineralogical students would have to be trained in accordance with the syllabus laid down by the University of London instead of that laid down by the industrial people of the country.

The new system of training in the Mining School was established, not by University professors, but by people actually engaged in the mining industry; and a Board of Mining and Metallurgy is now being set up to advise from time to time as to the courses of the Imperial College and also, when they think proper, to examine the system of education in the College to ascertain whether in all its details it is such as will turn students into what the profession of mining requires. This is considered a very essential feature in this institution, and it is hoped that it will run through every branch of training in the College. That is marking a very considerable advance from the old system of learning science, under which teachers in training had to go through a very large number of subjects, perhaps not very definitely connected with one another, and had to go out to classes all day to learn certain things to teach to other people.

TECHNOLOGY AND RESEARCH.

The Imperial College is a great technological college whose object is to give men technical professions; that is the object of the institution, and although it is a very slow process to break away from tradition in England, it is hoped that in the long run this end will be attained.

In addition to the educational training of youth mentioned, there are post-graduate courses, so-called because one thus best understands what is meant. Of course the College trains people who are not graduates. What it cares to know is whether, when they come to the most advanced courses, their training has been sufficient to enable them to profit by them. In that direction the Imperial College must develop primarily if it is ever to be really Imperial. It is hoped that its desire and power to serve will be recognized by other institutions both at home and abroad. The authorities are endeavoring to get as near as possible to the ideal position of a higher institution for research work, etc. Of course it will take a long time to attain the things sought.

SHOP TRAINING *vs.* FORMAL STUDIES.

In answer to a question as to whether there is an equivalent in mental discipline for developing powers of perception and clear thinking and good managing in the training obtained in shops compared with formal studies in classrooms, Sir Edward Thorpe said much depended on the individual, but his own impression was that a young man who has been at a good school is very much more plastic material; he knows how to learn in a much better way than the man who has

been going only to night classes and has scratched along as best he can. Of course there were many exceptions, and there was good in both.

Prof. Perry told how excellent the workshop boys were in Physics, which was his subject. He said the training of those men had been mechanical, and the difference in their favor was something enormous; but a full comparison cannot be made, because the College does not get those who come in from Secondary Schools who have also trade qualifications.

In reply to a question as to how the Imperial College expected to reach its high aim, although admitting so many young men who have not had even what may be called Junior Matriculation standing; Prof. Perry asked, "But is it necessary that a man should have these qualifications? If you are to have a general qualification, the university qualification is a good one; but surely you are not going to keep men out of the high posts in industries because they are not able to take a little Latin? We usually assume that if a man knows a little Latin, he has been to a good school; that is all; but you can have a bright man without even his knowing French. Of course he would not live long in Montreal or Quebec without knowing French, but we are pretty certain about this—that a man can become a very good engineer without being able to pass the University examination in Latin; in fact, some of us think such training as it implies is a disqualification."

Professor Farmer (Botany) said that his experience did not accord with Prof. Perry's. He thought these students who had a good general education did a great deal better, both with him and in after life, than those who had not. The kind of subjects which his students had to know were rather more multifarious than those required in engineering, and one important fact was that the conditions under which they work render it necessary for them to have access to the work of other nations; hence languages became more or less essential to them. Prof. Perry added, "The only sort of bar to a man's following any course of instruction is the bar of not understanding what the professor himself might say. If I find a man who has not enough previous knowledge to understand what I am going to talk to my students about, and use in my laboratories, he should not attend my course."

The Imperial College, in the three institutions, was attended by about 800 students.

SECTION 2: THE UNIVERSITY OF LONDON.

In this Section the Commission confines itself to a brief statement of some of the points of information, likely to be useful for Canada, as obtained in 'Conversation' with Dr. Henry Alexander Miers, Principal of the University, and other gentlemen who kindly received the Commission.

The affairs of the University, in respect to the working of the present organization, are in a state of flux. A Royal Commission on University Education in London, which had the matter under inquiry and consideration during nearly three years, has presented its final Report. If the Report is acted upon in full, the University will have eight Faculties, viz.—Arts, Science, Technology, Economics, Medicine, Laws, Theology and Music; and the very wide and varied educational service by the University will be continued and extended.

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The teaching in Engineering, Mining and Metallurgy for the University goes on in many institutions. Most of the Engineering and Mining teaching in London of the higher sort, for instance, goes on at the Imperial College of Science and Technology. That is recognized as a school of the University; or in other words there are teachers on the staff of the College who are recognized by the University as University teachers, and whose students can therefore enter for the examinations for University degrees. The Academic Council of the University approves of courses of instruction given in the 31 Colleges and Schools of the University, otherwise the students at such Schools could not enter as internal students of the University.

In London the situation is complicated by the extraordinary degree system. Any student entered may pass the matriculation and the degree examinations without any attendance, except in the faculty of Medicine. It is still open for a student at any institution in London, or anywhere in the world, to enter himself as an external student and take the degree, no matter who may have been his teacher or teachers. The number of external students is increasing.

The University provides for the teaching and training of internal students over an area within a radius of thirty miles. There are always a number of students from the Polytechnics, at which there are teachers who are recognized by the University.

In the case of a Polytechnic where there is an advisory body composed of the manufacturers of the locality, if and when they approve of or desire a certain course, they are represented on the University Council that supervises the course at that particular institution. The Boards, which draw up the studies at the institutions, are often composed to a large extent of gentlemen other than teachers, so that the industries are very fully represented in the drawing up the syllabi for examinations.

The students do not require University matriculation for all the courses in the Polytechnics, as it has been found that a student has great difficulty in going back and getting up matriculation subjects. At the same time, the number of the City and Guilds students who qualify to take the University degree increases year after year; and the percentage of the students who take the University degree increases yearly.

Engineering is taught on a large scale not only at the Polytechnics but in University College and King's College.

Domestic Science subjects, by themselves, do not lead to a University degree or diploma.

The various institutions, Polytechnics and Colleges, have been gradually developing themselves, and only ten years ago an effort was made to coordinate these through the instrumentality of recognizing teachers and courses of study at all similar institutions. A Commission is now considering that organization.

The institutions in connection with the University for the training of teachers are: The London Day Training College, The Goldsmith's Institution, The University College, King's College, King's College for Women, The institution in the south of London for Anthropology, and about 13 institutions which are

called Schools of the University, where there is teaching for the degree of the University.

The examination papers for these institutions are set by examiners appointed by the Senate. The mode of appointing examiners is this. On the report of the Board of Studies two, or sometimes four, examiners are appointed for each study. These are for external students who are trying for a degree. There are other examiners for internal students, about seven or eight recognized teachers being appointed in addition to the four external examiners. Two examiners, generally one internal and one external, are told off to set each paper. When they have set the papers, they are submitted to the whole Board of the 11 or 12 Examiners for discussion and consideration and, after being approved they are printed and sent to the candidates. In the Faculties of Arts, Science, Mechanics and Engineering the internal and external examinations are separate. The only ones in which they are identical are Medicine, Law, Theology and Music. The University is bound by statute to try and make the standards of the two examinations the same.

The question of men who have had shop practice and who wish to go to a University to prepare for teaching industrial and technical classes has not come before the University Authorities as yet. The question is one of very considerable practical difficulty, because the kind of people that would be useful as teachers are the skilled persons who are snapped up by the employers. They are so valuable that the employers prefer them; therefore the demand on the part of the colleges for competent teachers, who have shop experience and teaching ability, is one which it is exceedingly difficult to supply.

The Board of Education has a system of national scholarships intended to meet this difficulty in England. It has been a means of bringing a very large number of men straight from the works to schools and colleges which have given them academic training.

The demand in Canada for this class of teachers is likely to be very much larger than the demand in England, where University Extension work to train foremen and other men, who already know the craft, into teaching ability and to make them competent for evening schools through literary assistance and training in the art of teaching as such, is being rapidly developed.

In connection with the London University alone there are 15 classes, each attended by about 30 working people who band themselves together to attend a certain course, and attend regularly during the session. Their desire is not to be transferred from their present work, but to get more knowledge, not particularly for teaching, for the sake of the intellectual and social benefits of University training. These people could be utilized as teachers for evening schools. The great difficulty in getting teachers who know the trade and shop conditions, and who also have enough general intellectual culture and ability to be good teachers, arises from the fact that such practical men often have not the faculty of expressing themselves. A common complaint is that boys learn so much at school that they do not learn to use their own language in writing and speaking. No teacher can be a successful teacher without knowing how to use his language.

CHAPTER VII: MANCHESTER.

SECTION 1: INTRODUCTORY.

The Municipal School of Technology represents the highest form of technical education offered in Manchester. It has day and evening departments, the total number of individual students amounting to 5,299, of whom about 300 attend the full-week day classes. In the evening department, group courses of study are arranged as follows:—General 1st year courses: Mechanical Engineering, Electrical Engineering, Plumbing, Sanitary Inspection, Municipal Engineering, Building Trades, Cotton Spinning and Cotton Weaving. These are attended by 477 students in all.

The Municipal School of Art also has day and evening classes.

EVENING CLASSES THE FEATURE.

There are Evening Schools conducted by the Education Committee in addition to those mentioned above, these being divided into three groups, viz. Grade I, Evening Continuation Schools and Lads' and Girls' Clubs; Grade II, Branch Technical Schools, Branch Commercial Schools and Evening Schools of Domestic Economy; Grade III, Municipal Evening School of Commerce, Central Evening School of Domestic Economy, and Teachers' and Special Classes.

The number of evening students in all the evening classes, both those of the Schools of Technology and Art and those under the Education Committee, was 22,362, or 3.9% of the population.

The courses in the Evening Continuation Schools cover 2 years, and comprise technical, commercial and domestic subjects.

There are 6-year courses for technical students, the first 2 years being taken in an Evening Continuation School, the next 2 years in a Branch Technical School, and the last 2 in the Municipal School of Technology.

The 6-year commercial course is similarly arranged, the first two years being taken in the Evening Continuation School, the next 2 in the Branch Commercial School, or in the Municipal Evening School of Commerce, and the last 2 years at the latter institution.

It is a noteworthy fact that employers co-operate with the education authorities, allowing their employees to attend classes, and granting them facilities to do so. Some firms pay the fees for their employees, others refund them, and in some cases raise wages for successful studies at the evening school. The education authorities are prepared to furnish reports to employers on the progress of their employees.

DAY CLASSES ALSO.

The Municipal School of Technology has special day classes for engineering apprentices. These boys are selected by their employers and give one full day of 8 hours a week. They are found to make more progress in this way than at evening classes.

There is also a day class for apprentice painters and decorators, as well as one for apprentice plumbers.

TRAINING FOR GIRLS.

Girls attending elementary schools receive special training in Domestic Economy at Housewifery Centres, which are equipped and furnished as workmen's cottages, at which the teachers reside. The course covers 7 to 8 weeks, and is attended by girls who are about to leave school. The instruction comprises Housewifery, Cooking and Laundry, and lectures are also given on the care of infants and young children. There are 45 centres for Cookery, 9 for Laundry, and 3 for Housewifery, and 9,949 girls attended in 1908-9. There is a special 3 months course at the Granby Row Centre, at which girls reside in turns.

The School of Domestic Economy offers a Housewives' Course of 6 months, on the conclusion of which a diploma is awarded. Girls from the Housewifery Centres can obtain scholarships to attend this school.

At the Evening School of Domestic Economy, a Housewives' Diploma is awarded on the completion of a 2-year course.

A Summer session is also held in connection with the foregoing.

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DIAGRAM A

ILLUSTRATING THE GRADED SYSTEM OF COURSES OF INSTRUCTION ADAPTED TO THE REQUIREMENTS OF THE DIFFERENT CLASSES OF STUDENTS IN THE MANCHESTER EVENING SCHOOLS. (*Read up.*)

GRADE III.—CENTRAL INSTITUTIONS.

MUNICIPAL SCHOOL OF TECHNOLOGY.	MUNICIPAL SCHOOL OF COMMERCE AND LANGUAGES.	MUNICIPAL SCHOOL OF ART.	MUNICIPAL SCHOOL OF DOMESTIC ECONOMY AND COOKERY.
Advanced instruction in Science and Technology.	Advanced instruction in Commercial Subjects and in Languages.	Advanced instruction in Art and Design.	Advanced instruction in Domestic Subjects. [Day classes only.]



GRADE II.—BRANCH TECHNICAL SCHOOLS, BRANCH COMMERCIAL SCHOOLS, BRANCH ART CLASSES, AND EVENING SCHOOLS OF DOMESTIC ECONOMY.

Second, Third, and Fourth Year Technical Courses, to meet the requirements of all classes of Technical Students.	Second, Third, and Fourth Year Commercial Courses, to meet the requirements of Juniors in business houses.	First and Second Year Art Courses leading up to the instruction at the Municipal School of Art.	Specialized Instruction in Domestic Subjects, for Women and Girls over 16 years of age.
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GRADE I.—EVENING CONTINUATION SCHOOLS.

First and Second Year Technical Courses, for Boys engaged in manual occupations.	First and Second Year Commercial Courses, for Boys and Girls engaged in commercial or distributive occupations.	First and Second Year Domestic Courses, for Girls desirous of receiving a training in domestic subjects.
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PREPARATORY COURSE.

For Boys and Girls who desire to improve their general education or who are not sufficiently prepared to take advantage of the above Courses.

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DIAGRAM

SHOWING COURSES OF INSTRUCTION EXTENDING OVER SIX YEARS FOR
TECHNICAL STUDENTS IN THE MANCHESTER EVENING SCHOOLS. (*Read up.*)

Advanced instruction in Science and Technology, in the Municipal School of Technology.
FIFTH AND SIXTH YEAR TECHNICAL COURSES.

Engineering Course.	Building Trades Course.	Chemical Industries Course.	Electrical Course.
Machine hrs. Construction.... 2 Applied Mechanics (Theoretical and Practical).... 2½ Mathematics..... 1 Geometry..... 1 <hr/> 6½	Building hrs. Construction.... 2 Applied Mechanics (Theoretical and Practical).... 2½ Mathematics..... 1 Geometry..... 1 <hr/> 6½	Chemistry hrs. (Theoretical and Practical).. 5 Physics (Theoretical and Practical).... 2½ <hr/> 7½	Magnetism and hrs. Electricity (Theoret- ical & Practical).... 2½ Mathematics and Geometry.... 2 Machine Construction.... 2 <hr/> 6½

FOURTH YEAR TECHNICAL COURSES.

Engineering Course.	Building Trades Course.	Chemical Industries Course.	Electrical Course.
Machine hrs. Construction.... 2 Applied Mechanics (Theoretical and Practical).... 2½ Experimental Mathematics.... 2 <hr/> 6½	Building hrs. Construction.... 2 Applied Mechanics (Theoretical and Practical).... 2½ Experimental Mathematics.... 2 <hr/> 6½	Chemistry hrs. (Theoretical and Practical)..... 2½ Physics (Theor. & Prac.)... 2½ Experimental Mathematics.... 2 <hr/> 7	Magnetism and hrs. Electricity (Theoret- ical & Practical).... 2½ Applied Mechanics (Theor. & Prac.).... 2½ Experimental Mathematics.... 2 <hr/> 7

THIRD YEAR TECHNICAL COURSES.

Practical Mathematics and Practical Drawing.....	3	hours weekly.
Practical Mechanics and Physics.....	2	" "
English.....	1	" "
	6	" "

SECOND YEAR TECHNICAL COURSE.

Practical Mathematics and Practical Drawing.....	3	hours weekly.
*Woodwork.....	2	" "
English.....	1	" "
	6	" "

FIRST YEAR TECHNICAL COURSE.

TAKEN IN BRANCH TECHNICAL SCHOOLS.

TAKEN IN EVENING CONTINUATION SCHOOLS.

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SECTION: 2: THE MUNICIPAL SCHOOL OF TECHNOLOGY, MANCHESTER.

The object of this School is to provide instruction and training in the principles of science in their application to the industrial arts, with a view to a right understanding of the foundations upon which these arts rest, and to promote their effective development. The circular of the School states:—

The successful career of a student depends essentially upon his previous general education, for unless this has been thorough and liberal no satisfactory progress can be attained in any of the departments of the School.

The power of clear linguistic expression, and the mastery of the elements of mathematics, physics, and descriptive geometry are vital as a means of successful study of the applied Sciences. The chief aim of all preparatory study should, therefore, be the effective training of the thinking and observing faculties.

It is impossible for a student to obtain full benefit from the courses of instruction unless there has been adequate previous preparation.

Mere interest in experiment, or in machinery in motion, or even evidence of manual skill and dexterity, without a firm grasp of the above named fundamental subjects is of small avail if the purpose of the student be to attack serious problems in engineering, physics, or chemistry, and to fit himself for a position of industrial responsibility.

The courses of instruction of the School are directed more especially to the requirements of the industries of South-East Lancashire, of which Manchester is the commercial centre.

The School accomplishes its purpose by means of lectures, laboratory and shop-work exercises, together with scientific research directed to the solution of industrial problems.

The essential aim of the instruction is the training of faculty through a systematic course of sound theoretical study, and the development of resourcefulness and habits of self-reliance by means of an exact, thorough, and progressive course of laboratory and shop work, so as to prepare the student after due experience for positions of responsibility.

Students are required to pass an entrance examination in subjects of general knowledge, or to produce satisfactory evidence to the principal of their attainments.

The courses of instruction in the respective departments also prepare for the degree of Bachelor or Master of Technical Science (B.Sc. Tech., or M.Sc. Tech.) of the Victoria University of Manchester and for the certificate of the University. Students proceeding to the degree must have first passed the examination for matriculation of the Joint Board of the Northern Universities, or such other examinations as are approved by the Board.

Special courses of fourth year post graduate study and research are offered.

In addition to the regular courses there are special day courses for selected apprentices in the employ of engineering, plumbing and house painting and decorating firms and for library assistants.

EVENING STUDENTS.

The School of Technology offers to evening students systematic courses of technical instruction and training in all the chief, and in many of the minor, industries of the city and district. Such students must be not less than sixteen years of age at entrance and have such previous preparation as will enable them to enter profitably upon the course of study they elect to pursue.

The Education Committee have provided in all parts of the city at convenient centres, suitable preparatory courses of instruction leading up to the

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more advanced and specialized courses of the evening classes and of the School of Technology and of the School of Art.

Similar provision is also made, in Evening Continuation Schools and in Branch Intermediate Schools, for evening students beyond school age, for courses which include subjects of general knowledge, science, art, technology and commerce as well as domestic subjects for girls and women.

Classes for teachers in the subjects of Manual Training, Kindergarten Training and for certificate and scholarship courses are also provided. Provision is made for persons desirous of proceeding to the external degree examinations of the University of London.

In the Central Evening School of Commerce complete courses of instruction are offered of an advanced character in subjects bearing upon commercial and professional pursuits for which the courses, provided in the Intermediate and Continuation schools above named, are intended as preparation in cases where the general education is deficient.

ORIGIN OF THE MUNICIPAL SCHOOL.

The Municipal School of Technology is the direct outcome of the Mechanics' Institution. This form of educational effort was for nearly 80 years of the nineteenth century, in the main, the only means whereby the working and, in large part, the middle classes found the opportunity of continuing their education or of making up the serious deficiencies which resulted from the inadequate provision of day school education that characterised the years preceding the great educational enactment of 1870.

After committees of enquiry had visited the Continent of Europe and individuals had visited the United States, the erection of the new school was begun in 1895.

On October 15th, 1902, the new building was opened in the presence of a distinguished audience by the Prime Minister, The Rt. Hon. Arthur James Balfour, M.P. In the course of his address he referred to the School in the following terms: "This building is perhaps the greatest fruit of its kind, the greatest fruit of this kind of municipal enterprise in this country. . . . Nobody can go over this building, observe its equipment, study even in the most cursory manner the care which has been devoted to it, without feeling that the Corporation of this great city have set a great example worthy of the place they hold in Lancashire, worthy of the place they hold in Great Britain."

TECHNOLOGICAL DAY COURSES.

The school offers to-day students who have reached their 16th year the following courses, each of 3 years' duration:—

- 1.—Mathematical Courses.
- 2.—First Year General Course.
- 3.—Mechanical Engineering.
- 4.—Physics and Electrical Engineering.
- 5.—Municipal and Sanitary Engineering.

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6.—Applied Chemistry.

- (a) General Technological Chemistry.
- (b) Chemistry of Textiles (Bleaching, Dyeing, and Printing).
- (c) Manufacture of Paper.
- (d) Metallurgy and Assaying.
- (e) Brewing.
- (f) Electro-Chemistry.
- (g) Photography.

7.—Textile Manufacture.

8.—Photography and the Printing Crafts.

9.—Advanced Studies in Technological Subjects.

10.—Engineers' Apprentices' Course.

11.—Plumbers' Apprentices' Course.

12.—Painters' and Decorators' Apprentices' Course

13.—Architectural Courses.

14.—Library Assistants' Course.

The courses in Cotton Manufacture and for Engineers' and Plumbers' Apprentices are here given as representative of the others, and as useful for consideration in Canada.

COTTON MANUFACTURE.

Courses of Instruction—These are designed to give a sound training in the theory and practice of Spinning and Weaving to those who are or intend to be engaged in the spinning of yarns, the design and manufacture of woven fabrics, the buying and selling of yarns and textiles, or the manufacture or export of textile machinery.

The scheme of theoretical, practical, and experimental study extends over 3 years, and includes the technology of fibres; the principles and processes of spinning and weaving as applied to cotton, silk, and mixed fabrics; the analysis, testing, and costing of yarns and fabrics; freehand drawing and applied design; geometrical and machine drawing; mathematics, mechanics, physics, and mechanical and electrical engineering; construction of works, and factory law; and chemistry in its application to the treatment of textile fibres, and to the materials used in sizing and other textile processes.

Whilst the courses are specially intended for those who can give all their time, facilities are also offered to persons employed in the textile industry whose employers are willing to give them the opportunity of attending such lecture, laboratory, and workshop courses as may be arranged after consultation with the head of the department.

Times, in addition to and other than those set forth in accompanying time table, are arranged in the subjects of practical spinning and weaving, the testing of fibres and fabrics, and in design and drawing and the analysis of cloth.

Equipment.—The department contains a complete plant for ginning, mixing, opening, carding, combing, spinning, roller covering, doubling, gassing, reeling, preparing and bundling cotton yarns, and for the spinning of waste cotton, the preparation of cotton and mixed yarns for the loom, the manufacture of cotton and mixed goods by hand and power, silk reeling, throwing, preparing,

and the manufacture of silk by hand and power; and for the chemical, microscopical, and mechanical testing of fibres, yarns, and fabrics, arranged as follows:—

Preparatory Treatment of the Cotton Fibre.—Typical cotton gins—Roller and hopper bale breakers, conveying lattices and cotton bins—Willow, compound opener with hopper feed and lap attachment, single scutcher—Revolving flat, roller and clearer, and condensing cards—Sliver lap, ribbon lap, combers and drawing frame—Slubbing, intermediate, roving, and jack frames—Stripping, grinding, and burnishing machinery, for flats, rollers and cylinders, flats fastenings.

Spinning.—Waste, medium, and fine mules, also an experimental mule—Twist and wet ring frames—Roller covering plant—Doubling winder, ring doubler and twiner—Clearing, gassing, reeling, preparing and bundling—Experimental machines and working models—Plans of mills and arrangements of machinery—Specimens of coarse, medium, and fine grey and coloured cotton in various stages of preparation

Weaving Preparation.—Winding machines for warp and weft—Mill, beam and sectional warping machines—Running-off frame for sectional warping—Yorkshire dressing frame—Drawing-in and twisting frame—Dobby card punching machines—Piano card cutting machines—Lacing frames.

Hand and Power Loom Weaving.—Dobby, jacquard, and pattern hand looms—Tappet, dobby, and jacquard looms, with single and multiple boxes—Leno, lappet, terry, plush and automatic looms—Working models—Diagrams and plans of machinery in mills.

Silk Spinning and Preparation.—Cocoon reeling machines—Winding, cleaning, doubling, spinning, throwing, and reeling machines, reel steaming chest, reel stand, dramming and deniering scales, splitting rices, boiling pan, steeping tub and soap cutter, for hard silk; and also the following machines for soft silk: Winding, re-drawing, pirn winding, mill, and sectional warping and winding on.

Silk Weaving.—Jacquard, swivel, gauze, and velvet hand looms. and English and foreign tappet, dobby, and jacquard power looms, with single and multiple boxes, a jacquard swivel and a ribbon loom.

Textile Testing Laboratory.—Wrap reels, scales and balances, microscopes, lea testers, single thread testers, twist testers, mechanical and hydraulic cloth testers, water bath ovens, conditioning stoves, hygrometers, and other appliances for special work.

The driving throughout is by means of electric motors of power ranging from 4 h.p. to 20 h.p. A complete humidifying plant and independent heating pipes are fitted to secure the necessary temperature and degree of humidity.

The class rooms are fitted with every convenience and appliance for the complete illustration of the lecture courses. There are also collections of English and foreign models of textile machinery and appliances and of ancient and modern textiles. The library contains English and foreign books and periodicals relating to the textile industries. The journal of the Textile Society established in the School is issued annually.

The subjects of the course for the first year, with the hours per week devoted to each subject are as follows:—

Subjects.	Hours per week.
Mathematics.....	4
Mechanics.....	1
Experimental Mechanics and Sketching of Textile Machinery.....	2
Geometrical Drawing.....	2
Textile Engineering Drawing.....	2
Physics, including Laboratory.....	3
Textile Fibres and their Preparatory Treatment.....	1
Spinning Calculations.....	1
Fabric Structure and Weaving Calculations.....	1
Weaving Mechanism.....	1
Principles of Colouring.....	1
Freehand Drawing.....	2
Technical Design and Analysis.....	3
Practical Spinning.....	6
Practical Weaving.....	
Total.....	30

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SPECIAL DAY COURSE FOR ENGINEERS' APPRENTICES.

This course is arranged to afford facilities for the instruction in special day classes of selected apprentices employed in engineering works. Fee for each year of the complete course, £1 10s.

Candidates should give evidence of a satisfactory knowledge of mathematics and mechanical drawing, and be of such good character in respect of conduct and capacity as to deserve the privilege of attending this course.

In order that the organisation and business arrangements of works from which apprentices are drawn may be disturbed as little as possible, classes comprised in the course are held on Monday, extending from 9 a.m. to 1 p.m., and from 2 to 6 p.m. throughout the whole session of 40 weeks.

The subjects included in the course are as follows:—

FIRST YEAR:

Mechanics Lecture.....	9 a.m. to 10 a.m.
Physics Lecture.....	10 a.m. to 11 a.m.
Mechanical or Physical Laboratories.....	11 a.m. to 1 p.m.
Mathematics.....	2 p.m. to 4 p.m.
Engineering Drawing.....	4 p.m. to 6 p.m.

SECOND YEAR:

Mathematics.....	9 a.m. to 11 a.m.
Properties of Materials and Theory of Structures (First Term).....	11 a.m. to 1 p.m.
Theory of Machines and Theory of Heat Engines (Second Term).....	11 a.m. to 1 p.m.
Electrical Machinery.....	2 p.m. to 3 p.m.
Electrical Laboratory.....	3 p.m. to 4.30 p.m.
Engineering Drawing and Engineering Laboratory.....	4.30 p.m. to 6 p.m.

The time thus arranged is equal to that given on four evenings per week in the evening classes, and, moreover, the session is some ten weeks longer than the evening session. The student has the further advantage of being relieved from attendance at evening classes, so that he has full opportunity to prepare the home-work and do the reading required, and under these circumstances can obtain a more extended and more satisfactory course than the evening classes afford.

Students who propose to take the second year course must take a paper equal to that of the final examination in Mathematics of the first year.

TEXT BOOKS—First Year; Algebra, Hall and Knight, 3s. 5d.; Trigonometry, Hall and Knight, 3s. 5d.; Machine Construction, Crye and Jordan, 2s. 3d.; Applied Mechanics, Cryer and Jordan, 2s. 3d.; Class book on Physics, Gregory and Hadley, 4s. 6d.

Second Year: Practical Mathematics, Saxelby, 4s. 11d.; Testing of Materials, Popplewell, 10s. 6d.; Strength of Materials, Popplewell, 5s.; Graphical Statics, Gray and Lowson, 2s. 8d.; Heat Engines, Ripper, 2s. 3d.

SPECIAL DAY COURSE FOR PLUMBERS' APPRENTICES.

This course, which extends over two years (with a special course for students who can attend for a third year), is intended for the education and training of plumbers' apprentices. Fee for each year of the complete course, £1 10s.

Candidates must not be less than 16, and should possess a fair knowledge of the preliminary subjects connected with plumbers' work; should be nominated by their employers as of good conduct and capacity, and worthy of the privilege of attending the course; and are required to attend regularly and punctually, and do all the necessary home-work. Reports are periodically submitted to employers on the progress of their apprentices, and those students who pass satisfactory examinations and make the required attendances during the two years' course receive certificates.

EVENING CLASSES.

SCIENCE AND TECHNOLOGY.

- I.—General First Year Course.
- II.—Pure, Practical, and Applied Mathematics.
- III.—Mechanical Engineering.
- IV.—Pure and Applied Physics.
- IVa.—Electrical Engineering.
- V.—Architecture and Builders' Work.
- Va.—Municipal and Sanitary Engineering.
- VI.—Pure and Applied Chemistry.
- VII.—Photography, the Printing Crafts, and Bookbinding.
- VIII.—Textile Industries.
- IX.—Dressmaking, Millinery, Plain Needlework.
- X.—Natural Science.
- XI.—Miscellaneous Technical Subjects.

Group V is chosen as representative of the work in the other groups.

ARCHITECTURE AND BUILDERS' WORK.

This course provides for the complete training of men engaged in the Building Trades in the theory and practice of Building Construction.

It extends over 5 years, and evening students following a systematic course and fulfilling the conditions as to examination can thus obtain the diploma of the school.

The instruction is at once theoretical and practical, and wherever possible students are counselled to take full advantage of the workshop and laboratory courses.

Many of the subjects of study in the more advanced stages will be found of especial benefit to articted pupils of architects and surveyors. Excellent facilities are provided for the study and testing of materials of construction.

Particular attention is directed to the important courses in the subject of Sanitary Engineering, which are of special value to architects, surveyors, engineers, and to others engaged in the work of local government administration.

There are special courses for House Painters and Decorators, Cabinet Makers, Masons, and Metal Plate Workers.

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SECTION 3: CONVERSATION WITH MR. J. H. REYNOLDS.

Information obtained in "Conversation" with MR. J. H. REYNOLDS, Principal, Municipal School of Technology, Manchester.

Mr. Reynolds said he kept in close touch with the industries of the particular neighbourhoods, and reported monthly to different firms on the progress of boys. If building trades are strong in a neighbourhood, he provided courses in those trades; in another section the inclination might be in the direction of chemistry. While very glad to allow any persons who took an interest to form an advisory committee, the activity of such a committee would make the management very cumbersome.

The real crux of the success of evening classes is that employers be kept in sympathy with the work and believe in its advantages. Boys going into evening school do better from every point of view than those who do not; not only from good influence as to character, but from getting the kind of knowledge to make them more observant, more intelligent and more in touch with their daily work. They get the elements of practical arithmetic, drawing, mechanics and physics; and every endeavour is made to illustrate the principles and apply the boy's knowledge directly to his work. If employers are in sympathy, the school succeeds, but it is difficult to get the sympathy of employers in a small way of business, because they want to get as much as possible out of the boy.

The enormous amount of overtime in the workshops troubled Mr. Reynolds, who finds the greatest difficulty in maintaining evening attendance when trade gets busy. The men who attend such institutions as these, paying their own fee and giving their time, never come to waste their time, and would not attend if it were not for their advantage—which is necessarily that of their employers.

VALUE OF EVENING SCHOOL.

The evening school has been an enormous gain to Lancashire, having been the means for 60 or 70 years of enabling a large number of men to raise themselves to positions of responsibility, and in some cases affluence, as the result of such training. No two counties in England are doing more for the education of the artisans and persons employed in the day time than Lancashire and Cheshire. One cause of this is the tradition that has grown up in these two counties in favor of adult education, and the strong interest always taken in the various institutions such as the Mechanics' Institute, established long before the present Acts of Parliament. There is a Union comprising all the evening institutions of the two counties, whose committee meets monthly in Manchester, and virtually controls a great deal of the continued education carried on in the two counties. This year at least 120,000 papers have been worked in the various subjects relating to continued elementary education, apart from the Science and Art department. The men in control are thoroughly interested in their respective institutions, and are doing a thoroughly effective work. They set the papers and largely control the teaching. The movement is growing in influence and numbers.

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GERMANY GAINS ON ENGLAND.

Mr. Reynolds was of opinion that up to a certain period there were numerous reasons why England should be in the position she does occupy—her geographical position, climate, natural resources and the energy and capacity of her people. All those things gave England her position. But times have changed, and the last 40 years have created a revolution in industry, especially chemical and electrical. Germany has gained on England because more intimate knowledge of natural phenomena has become necessary in industry, and the native capacity and other adventitious causes of England's success no longer apply to the same extent.

EDUCATION HELPING WORKINGMEN.

Conditions of living among the workers have greatly improved since 1851. Mr. Reynolds has been among working people all his life, and the difference in that class is enormous. That is quite consistent with the fact of a large number of derelicts, because the population was increasing by millions and there is as deep poverty to-day as ever existed in the nation, and a good deal of it. Education has reached every class of the community since 1870. Before 1870 Manchester was not more than a third of its present size, yet there were 16,000 children running about the streets going to physical destruction. Now every child is looked after. The amenities of life are much better attended to now. At that time there were 20,000 people in Manchester living in cellar dwellings, practically holes in the ground. There has been an enormous improvement in the standard of living; people will not endure to-day what they endured then; the outlook generally has improved. More than a generation of workers has gone through the schools who before 1870 did not go to school at all.

Mr. Reynolds said that, when he was a young man, he had taught reading, writing and arithmetic regularly on Sunday afternoons, and many men who are to-day in good positions never got any other education except what they got in Sunday schools, which were very powerful at that time in this city. Personally he would not mind using Sunday now in that way, but public sentiment is against it. At that time people had no other chance, for they worked very long hours. The Saturday afternoon holiday is only about 60 years old; before that everybody worked till ten o'clock on Saturday night.

Mr. Reynolds said that while Technical Education is more highly appreciated by the public than it was 15 or 20 years ago, yet men like himself, urgent in the pursuit of this work, felt the want of sympathy. In his opinion there is not the same appreciation of education as a whole in England as there is in Switzerland or Scotland. Referring to a meeting he had addressed, when the question was afterwards asked him why he should have been talking to them about the value of education when there were plenty of men in the room worth £30,000 who had never been to school in their lives, Mr. Reynolds remarked that conditions had largely changed, and such men would not now have as good a chance to get on; but we must recognize that an Englishman can make a vast deal of use of a very small amount of knowledge.

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EDUCATION IN MANCHESTER.

There is only one public educational authority in Manchester, and Mr. Reynolds was against a division of authority—one controlling elementary and secondary education and the other controlling technical education—because education is one thing and rests on a broad basis if it is education at all. As soon as a child is able to go to school, it must be trained body, mind and soul, up to a certain age. The vast majority of children must go work at 14; so the problem is how far you can pick out from the ruck of children those able to extend their general education to a later day.

In Manchester the evening classes are held in the elementary school buildings. If a boy is taking secondary education, Mr. Reynolds would continue his general education in the secondary school; he was against specialization either in elementary or secondary schools. If he knew a boy would be leaving at 14, he would arrange his subjects carefully, but they would still remain general subjects, for nobody knew how he was going to get a living.

There should be some trade schools for elementary boys and girls, because he thought the time was short enough to give them a broad, sound basis of general education. This was quite consistent with carrying the kindergarten principle right through the whole course, to train hand and eye the whole time, so that whenever a boy leaves school, his mind is alert, he has been taught to use his hands in co-ordination with his eye and other faculties, and he is fit for any job that anybody likes to put him at, the question not being how much he knows, but how he has been trained.

One of the most important things, Mr. Reynolds thought, was a thorough knowledge of English and all that that implies, which is more than mere knowledge of grammar and rhetoric, and includes the history of the country and the whole language. If this, with a knowledge of geography, were made important features of the schools, and the applications of mathematical training were made clear to the boy, he did not see why these things should turn the pupil from industrial pursuits at all.

TRAINING OF LEADERS.

The question of training leaders in industrial activities—whether they should be men who had had training in the shops or those who had been reserved longer for training before going into the shops—was rather a difficult one in Mr. Reynolds' view. He thought that it would be a great advantage to get young fellows who had had a year or so in the shops to come to the Technical Institute in the day time, provided they kept up their knowledge; but if they allowed their school knowledge to grow rusty, they would find great difficulty in taking a position in that Institute after a year or two. The German Technical High School now requires that very thing—that at 18 or 19 a boy must go into the shops, and then for four years go to a Technical High School. That drives a man to 23, or, counting a year for military service, 24, which makes him too late in an industry. One difficulty in Manchester is that once a fellow has

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got into a shop and found his feet there, he is not likely to leave it because he does not know that he will get back readily, and he would rather stick there and go to classes in the evenings and do the best he can.

DAY-TIME COMPARED WITH EVENING INSTRUCTION.

Mr. Reynolds was in favour of part time work by which apprentices attended the Institute for a full day weekly, and expressed decided preference for that plan over having them come two or three times a week for a few hours. He thought it was one of the best features of the work that they were doing, but it had not got on as it should have done. Seven hundred are now coming in from 16 to 18. He thought the advantage is unquestionable. The school term is 40 weeks, or 320 hours, as against 180 hours of evening work at the very most, with the advantage that their evenings being free, they could do their reading and homework, and get reasonable recreation. If men were let off at 5 o'clock and came to the evening classes, it would not be as well as having the day's work at the Institute. When the man has had his rest and comes fresh to the study, the Institute can begin serious work with him and keep it up all day, without his flagging. That was a feature in favour of the choice of Monday. What is really wanted, in Mr. Reynolds' opinion, is some legislative measure whereby a boy leaving school at 14 to 17, would get time enough to continue his education in the day time. That would mean that he should not be expected to go more than 30, or at the very outside 35, hours weekly to his employment. That would enable the Institute to deal with him satisfactorily from the point of view of his education. However the plan of giving one day weekly can, in the best circumstances, apply only to a small number.

Mr. Reynolds has not an atom of sympathy with legal compulsion to attend evening classes. If there is to be any compulsion, it must be on the employer to give the time in the day, and not on the parent or the boy. It is impossible to do it in any other way.

WHEN BOYS LEAVE SCHOOLS.

Every week the City Education Department sends to Mr. Reynolds' office a list of boys who have left school that week. Mr. Reynolds' office writes to the boy, and if it is late in the session, says "Here is a permit to entitle you to come next session, or to an evening school, for so many hours a week," Mr. Reynolds had found that more than half attended the classes at their own cost. A number of scholarships were given to evening students, and the plan worked well.

As to the increased value to employers of apprentices who attend the school, as against those who do not, Mr. Reynolds said there were various opinions. Plenty of people, especially those engaged in engineering, say that technical education in evening classes is not worth a straw. Such people will ask, "Why does the boy want education? He has only to turn a machine;

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he simply minds the machine." That is all they want. Mr. Reynolds' point of view was quite different. He said to the boy, "While you are minding that machine, try and improve yourself in the direction in which you are engaged; follow up all about it." It is an individual matter for the boy; it is not for the employer to say he does not need education.

ATTITUDE OF TRADES UNIONS.

As to the attitude of the trades unions in Manchester, Mr. Reynolds said they had not been any obstacle to technical education, but they had not given any impulse to it. He had always found the trades union officials sympathetic, but he could not say he had had any help from the trades unions in the movement for the training of artisans engaged in various trades. Asked as to the motive of the Plumbers' and Steamfitters' Union, which objected to the admission of men not engaged in that business, who afterwards decided that all their apprentices should attend the school, Mr. Reynolds said he thought there was a feeling among the plumbers that the class had given them something of real value, because plumbing is a trade which may be done on a large or small scale, and is mostly done by the small master who has at most two or three men and an apprentice, and cannot give the apprentice the range of work sufficient to make him a good workman. Another factor is that many things in plumbing that now require great deftness and skill are being made by machinery, such as the bending of pipes; the plumber does not know how to make a drop or bend lead or boss it up. The school gives opportunity to learn these things.

He had had trouble with the Printers' and Lithographers' Union, who had objected to salesmen in shops entering these classes, but Mr. Reynolds had argued, "Who is going to get the orders by which you live? If a salesman understands these processes, he is going to bring you trade, because he can talk to the customer far more intelligently, and he needs to know all about the various processes." So a salesman may go to learn bookbinding, that he may talk more intelligently about it. An articled clerk in an architect's office might enter a plumbers' class, and Mr. Reynolds would not object, and would tell the plumbers that it would be good for them, because such a man would not be content that a contractor would have his own way, but would have something to say for the plumber. Mr. Reynolds thought that objections in such cases were through ignorance, and through taking short-sighted and narrow views of the question.

MACHINERY DISCOURAGES ALL-ROUND SKILL.

In the last thirty or forty years automatic machinery is used to a tremendous extent in making, on a wholesale scale, things which need only putting together. The classes in carpentry and joinery are not nearly as well attended as they should be because of this. A man has very little chance to become a chief joiner. When the enquiry was made in London, they found no London boys in the building firms, because they took improvers from the country where they learnt the minutiae of the business in small shops.

Mr. Reynolds said that his Committee had just bought 12,000 yards of land for a Domestic Science School that would accommodate 300 day pupils. Women are being trained as domestic economy teachers not only for Manchester but for anywhere. The present building is not big enough to afford room for everything they need in Manchester. They had no room for motor car engineering, though it is a good thing; but short courses of instruction are given to fellows of more or less experience and expert knowledge. If they think there is anything desirable to do, Mr. Reynolds at once takes it up and gets the committee to sanction the establishment of a class or classes in such work.

Mr. Cowan, Mr. Reynolds' assistant in the evening classes, has the organization of the evening classes all over the city; and if there is a district without a satisfactory class, or a demand in a neighborhood for a class, one is put there. The Manchester Institute arranges for instruction on Saturdays, and men come from as far as Hull, 120 miles away, returning the same night. Any subject that is likely to be interesting is taken up. For example, Calico Printing and Engraving were taken up a year or two ago, there having been no classes at all for those engaged in that work. Sometimes classes run dry in three or four years, all possible recruits having been exhausted. The classes were open to everybody, and the fees the same to people in and out of the city, or in and out of England; and Mr. Reynolds said he would not make a difference in the fees as between residents and non-residents.

THE INSTITUTE'S COST AND POLICY.

This school costs £18,000 yearly, above all received by way of Government grants and fees. The grant from the Board of Education (London) is nearly £11,000. The balance is borne by local rates and fees, the latter, which are very low, only a few shillings, totalling £5,000.

The graduates have as high standing as graduates of the Imperial College. It is a three years' course, and sometimes four, and stands as high as any degree course of a University.

Mr. Wrapson, the Assistant Superintendent, said that after all his experience it was not practicable to teach trades fully in school or in an institution; and he objected in particular to being asked to produce articles that could be sold, because the tendency would be to subordinate the instruction and training of pupils to getting work out on time or getting work that would have value. In the School for Commerce there was special attention given to training men for municipal service, and in the Technical School to training men for municipal service by way of management of motor cars; therefore while the rates for maintaining the schools were a tax, it was an economy in training their own servants for saving the municipal property and doing better work.

CHAPTER VIII: LEEDS.

SECTION 1: INTRODUCTORY.

The city of Leeds has a population of 445,600. Its chief industries are mechanical and electrical engineering, textiles, building and allied trades, commerce, leather and boot trades, clothing trades, mining, printing trades and chemical industries.

In 1905 statistics of the occupations of the residents in the different parts of the city were compiled to ascertain,—

(1) What industries were carried on in Leeds and their relative importance, with a view to deciding whether the supply of Technical Instruction was sufficiently complete and varied to meet the needs of the population;

(2) Whether the schools and classes in existence were conveniently placed with respect to the homes of those who might be expected to attend them.

Maps were prepared showing the areas where the heads of families engaged in the various industries lived. Another map showed the location of the various classes and schools adapted to the occupations. By superimposing a transparent copy of the latter over each of the former the adequacy or inadequacy of convenient provision was at once seen. On that basis plans for development and extensions were made. These provided particularly for the residents engaged in occupations as follows:—

Occupations.	Heads of Families.
Mechanical and Electrical Engineering.....	7,500
Building and Allied Trades.....	4,770
Commercial Occupations.....	4,400
Leather and Boot Trades.....	3,160
Clothing Trades.....	2,900
Mining Trades.....	1,300
Textile Trades.....	1,130
Printing and Bookbinding.....	800
Chemical and Allied Trades.....	700

Provision was made also for Bakers, Glass-blowers, Furniture Trades, Carriage Builders and Wheelwrights, Watchmakers and Jewelers and other industries.

TECHNICAL COURSES.

The courses of Technical Instruction in Leeds are well graded, ranging from the general evening Continuation Schools up to the University of Leeds.

The first grade is taken in the general evening school; the second in the various Mechanics' Institutes and Branch Artisan Schools, the latter for elementary courses, the former both elementary and intermediate. The third grade comprises the Central Technical School, the Cockburn Technical School

and the West Leeds Technical School (the latter for advanced courses); while the fourth grade is taken in the University of Leeds. Grade I covers preparatory courses; grade II the 1st and 2nd years technical courses for all trades; and the 3rd year course in Mechanical Engineering and Building at the Woodhouse Mechanics' Institute, and others taking this work; grade III comprises 3rd and 4th year courses in Mechanical Engineering, Electrical Engineering and Building, 3rd year in Chemical Trades, and 5th year in Mechanical Engineering; also Mining, Tailoring, Boot Trade, etc. The University offers advanced courses in Mechanical and Electrical Engineering, Mining, Textiles, Leather and Dyeing.

EVENING COURSES, ETC.

The evening Art instruction is well organized in connection with the *Central School of Art*. There are preparatory Art schools and branch Art schools leading up to the Central School, the aim of the entire co-ordinated instruction being the advancement of the industrial arts.

A special Saturday course is held for Teachers.

Evening craft courses are held in Bookbinding, Painters' & Decorators' work, Lithography, Cabinet Making, Stone Carving, Jewelry and Silversmiths' work, Jewelry Repairs, Wood Carving and Wrought Iron work.

Evening Commercial Work is organized from the general evening schools, through the branch commercial schools, the Central School of Commerce and other institutions of similar rank, up to the University.

Evening work in Domestic Arts is begun in the general evening schools, continued in the various Young Women's Institutes, and concluded in the Central Institute for women and girls. The subjects taken are English, Household Accounts and Correspondence, Cookery, Needlework, Laundry, Hygiene and Home Management, Dressmaking, Home Nursing, arranged in group courses.

Exhibitions and scholarships are available, in all the various branches of evening work, to higher institutions.

Training courses for Teachers of all grades are fully provided for, the subjects including Manual Training, Singing, Elocution, Physical Training, Art, Nature Study, Photography and Modern Languages.

There is a *School of Music* under the Leeds Education Committee.

SECTION 2: CONVERSATION WITH MR. JAMES GRAHAM.

Information obtained in "Conversation" with MR. JAMES GRAHAM, Secretary for Education, Leeds.

When Mr. Graham came to Leeds seven years ago he prepared a memorandum of the trades and industries of Leeds, taking a census of all the houses from £30 a year rental downwards, with six maps to show the locations of the

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workers for the different trades. Then they set to work to plant preparatory courses in Evening Schools, where they made good what young fellows had forgotten of their ordinary education. Then they put down Intermediate Schools of an artisan type for those engaged in works, giving a two years course; also Intermediate Schools of a commercial class; Intermediate Schools of a domestic class for women; Intermediate Schools with artistic classes for Art students, etc., then large Central Institutions.

They fixed the number, stuck to that number, carefully selected the men and started to train teachers, putting them through a two years course, during the first year of which they had to retail out what they got on Saturday mornings and certain evenings; but at the end of the second year they had covered practically the whole course, and the Intermediate Schools were running all right. For the Central Technical Schools they looked to graduates who had specialized in certain directions, and to men who were graduates engaged in practical work, or in special departments of the corporation, or as civil or electrical engineers, and put them in charge of the classes.

In a few years the whole course was running. They set up a system of registration, of record cards showing attendance and work, so that in a few years all the pupil had to do was to show his card and the new teacher knew exactly where to put him in the course. One problem was to lead young fellows on to higher institutions, and men who had been doing good work for two or three years were helped by technical scholarships on to the University. They went there full time, and were paid their full maintenance allowance. Ten of those scholarships a year were offered and the men proved the best in the technical department of the University.

PRACTICAL INDUSTRIAL ART.

Art in Leeds in the past began and ended on paper; it finished up with beautiful drawing, highly coloured, which might be awarded a silver or bronze medal. Mr. Graham felt that was not sufficient, and he brought over from the School of Industrial Arts, Geneva, Switzerland, an exhibit showing how the paper work was carried along through many stages and an artistic object produced in the form of a vase or statuette or piece of jewelry or a hundred and one other things. The actual artistic object was the finished product, instead of a design which remained on paper. That exhibition seven years ago opened the minds of many educational authorities, and caused them to turn the artistic teaching and training of England on to the craft basis. The Leeds School of Art has gone a long way in certain directions and certain crafts.

HOW ADVISORY COMMITTEES HELP.

Behind every craft or trade there is, in addition to the general Managing Committee of the school, an Advisory Committee of experts connected with each craft or trade, called together to consider or suggest any new development, to visit other places, to advise how the school should be equipped or the course

developed, and later on to visit the courses in progress, criticise the work, suggest improvements, and in a general way offer useful advice to students. The work of some of those crafts has greatly developed the different callings into which art feeling and instruction enter. The school has helped very largely to develop printing and lithographing trades, boot and shoe trades, etc. The process-engraving work of Leeds used to be sent away to Manchester, but as a result of the school's new process department a large number of the big printing works have developed process departments and a good deal of engraving is now being done in Leeds.

BOOT AND SHOE TRADE REVOLUTIONIZED.

The boot and shoe trade used to be chiefly the heavy boot with thick soles, for working men. Even that was dying out; many of the big manufacturers were folding their hands and heaving sighs because the prosperous times had departed, never to return. But the schools set up boot and shoe training classes, which gradually developed until now they have had to be taken into the technical schools and put into a separate building as a Boot and Shoe School. It has a modern up-to-date equipment under an arrangement with the machine makers that if they bring out an improvement on the machine now in school the old machine can be discarded and the new introduced by paying them a small sum per annum. Those machines are obtained at a very cheap rate because the school allows any prospective buyer to come and inspect them at any time. The boot and shoe business has been revolutionized in Leeds; the trade is now in light boots and shoes; and Leeds manufacturers can hold their own against the light boots of any other place. The U. S. boot trade has practically disappeared from England, although at one time it looked like collaring the whole British market. At present the English makers are busy clearing them out of the foreign markets. The export of boots from England is going up by leaps and bounds, running into hundreds of thousands a year and steadily increasing. That shows how co-operation between employers and the school can bring about a revolution in a trade, and regain ground which seemed to be absolutely lost.

How do the boot and shoe employers help the school? In many ways. They send their work people. Then if in the course of instruction the school wants a hundred pairs of boots at a certain stage of finish—say they want rivetting or finishing in a particular way—they have simply to ring up a number of shops and tell them so, and at the hour named the boots at that stage of manufacture are at the school, and are handed around to the students. The whole process is explained theoretically; the students are shown practically how the job is done; they make a trial of a quarter or half an inch, which is carefully watched; then another quarter of an inch, which is carefully inspected; then they are allowed to go ahead. That lesson in theory and practice is given, and the following morning the boots are sent back to the manufacturer. At any time and at any stage the manufacturers are always glad to let the school have the material at the stage required to carry on the manufacture one stage further.

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INTEREST OF EMPLOYERS AROUSED.

To get the interest and sympathy of the general employers of labour was a tough task. They took no notice of letters; then a man who had been in an engineering shop was engaged to interview the employers of labour and work up interest; also to call on boys who were leaving the technical schools, or who had gone into workshops and ought to be attending the technical school. That plan was very successful. Still the man engaged could not get hold of the big employers; and finally Mr. Graham and another gentlemen interviewed them. In some places they were received rather coldly, and in others with decided opposition. However, they persevered, returned, and in most instances succeeded. If they did not gain active support they asked employers of labour if they would let young fellows who were attending the technical schools leave half an hour earlier on school nights, and let them come to work after breakfast on the morning following their attendance at night school? Would they pay the fees? Would they let attendance at the technical school count towards promotion? and a number of other things. They got out a series of printed bills. The employers looked them over. One man would pay the fees and do nothing else; another would let apprentices leave a little earlier. A hand bill was printed for each one of these; finally a bill for the man who was prepared to do everything. This hand bill had every appearance of having been printed by the firm, and in a blank was inserted the name of an important clerk connected with the works who was told off by the firm to receive the names of young people who intended to go to the technical schools during the coming winter. This man proved to be a point of contact between the school and the works—one to whom Mr. Graham could go and discuss questions or deal with difficulties at any time. That was found very useful. The hand bill gave an outline of the courses.

PRACTICAL ABILITY DEVELOPED.

All this work resulted last year in an increase of 500 students, and this year an increase of 800 students, or a total of 1300 in two years in the evening technical schools.

The idea gradually permeated the whole of the technical schools of Leeds, which have 7,000 odd students, that they meant earnest work. The result is that they won't tolerate any student who is there wasting time; they are all ready for work; there is now an atmosphere and feeling different altogether from what prevailed formerly. Home work is secured in considerable quantity—an evidence of personal work on the part of the students; and a separate register is kept for this home work.

For the future, Mr. Graham does want to see day technical education in England under that of the University grade. He wants to see work such as that done at the Holbeck Preparatory Trade School put into every elementary school for boys throughout the length and breadth of Leeds, so that between the ages of twelve and fourteen they will have knowledge of the principles underlying

all the main trades of Leeds; their English will be much better than at present; their ability to draw will be much better. They will be able to read a plan and make measurements, and able to work out any practical arithmetic sum—based on measurements, statement of machinery details, etc. In short they will rapidly become skilled workmen either at the bench or at the lathe. If they are going to be that, the sooner they are into the works after 14, the better for the boys as mechanics.

COMPULSION AND HALF-TIME.

Mr. Graham would like to see an Act of Parliament making attendance compulsory between 14 and 18, so that half the boys would be in the works half a day while the other half were at the technical school, theory and practice thus going on hand in hand. This alternation could be for half-days, or half-weeks. In the shop the boy might be kept at one machine and become skilful at it, and as part of the competitive system he would be able to turn out an article accurately in a certain time, and thus enable the British engineer or workman to compete with his brethren at home and others in foreign markets. In the technical school the boy would be taught the theory of the whole trade, with an opportunity for practice on other machines. There would be sufficient equipment in the technical school to show how the theory was applied. By this half-time plan the boy would go through the whole trade and understand both theory and application. Skill would only be got in a workshop, but you would have a workman who, in case of upheaval in the trade or of his being turned from one department or trade, could enter another; he would be quickly adaptable and could pick up any trade because of his thorough knowledge of the principles underlying that trade, for the principles underlying all mechanical trades are practically the same.

This is what Mr. Graham hopes to see for the workman: "Out of the mechanic will come the foreman. There will always be an upthrust of brains; and we will have men who become managers and possibly controllers of large firms. That plan, joined to selection of the brightest boys who have worked four or five years in evening technical schools, who have worked on this half-day system, and who are sent to the University and kept there three or possibly four years with all fees paid and a maintenance of ten shillings a week, will produce an army of workers trained and adjustable, ready to face all possible competition, whether from Germany or anywhere else."

SCHEME LINKED WITH UNIVERSITY.

In drafting the scheme of Technical Education for Leeds the scheme of education was arranged according to the amount a young fellow could cover year by year in a technical school. The first two years were devoted to the general Evening Schools, the second two years to the Intermediate Schools, and the next three or four or five years to the Central Technical School or School of Art or Commerce or Domestic Science. The advanced science and

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the honors work were left to the University. In view of the very expensive equipment at the University it was considered unnecessary to duplicate that by putting it into the Central Technical School; so the education authorities worked out a co-ordination scheme and arranged with the University what they would do in regard to technical work during the day and evening. After this was agreed to the whole of the expensive University equipment became available for evening students, who can either go there entirely for the work or take part of it in one of the Central Technical Schools. This plan is working very satisfactorily and saving a great deal of money. The University is working very heartily with the Technical School, and in their evening department doing very excellent work.

When the technical organization was set up at Leeds the number of University students was inconsiderable, and the Principal was very much exercised. Mr. Graham told him, "You will lose students for two or three or possibly four years; at the end of the four years we will begin to turn into the University pupils who have been in our grade 1, 2 and 3 schools." Now about 80 pupils have been through the whole scheme, and are ready to take advantage of anything the University can give them, and move ahead very rapidly. Young people were lifted out of the workshops at the age of 22 and sent to the University; several groups have already passed from the University and are now filling very important controlling positions, thus showing that the money has been exceedingly well spent.

STRONG SECONDARY EDUCATION WANTED.

When Mr. Graham came to Leeds seven years ago they had a Grammar School for boys and one for girls, sadly in need of reorganization; two small Catholic Schools; two Higher Grade Schools, largely fed by boys from the elementary schools at the age of 12; not secondary schools as he understood them, but simply continuations of an elementary school. What he wanted, and what they are now getting, was a secondary school system giving a secondary school education, having its foundations laid in the kindergarten at 5 to 7 years, steadily developing through the years to the age of 17 or 18, and then rounded off and completed as secondary education, making pupils ready for the University. Leeds now has a strong system running from 5 till 11 or 12. Then scholarship holders from the elementary schools, 200 or 250 a year, act as tributaries to the main school; they take hold of the idea of the secondary school, and are indistinguishable either on play-fields or in class-rooms from the product that has been in the school since the age of 5 or 6 or 8. That result is secured by the atmosphere that has grown up from the age of 8 years. The idea is to carefully select the Principals, then give them a free hand and let them develop a system of schools every one of which differs from every other within the system, so that all the schools will not be as like as peas from the same pod.

There are roughly 3,000 pupils in Leeds secondary schools; 25% come in with free places, and a fair number of others pay fees; 483 last year came in

directly from the primary schools and paid the fee. Probably 700 would come from the elementary schools of the city or outside, either to pay fees or come in on scholarships. They come in about the age of 10 or 12.

SECTION 3: CONVERSATION WITH MR. BEES.

Information obtained in "Conversation" with MR. BEES, Assistant Secretary for Education, Leeds.

Mr. Bees, as assistant to Mr. Graham, said the educational movement in Leeds during the past 7 or 8 years had certainly been very rapid. Primary education had been too bookish; what was needed was to train the child in initiative so as to develop its capacity to do for itself, to take advantage of its surroundings and make the best of them. More education is wanted on the lines of Holbeck Trades Preparatory School, where the teacher does very little talking but acts as a guide, pointing out to the lad how he may get over his difficulties himself.

They had failed as regards girls by not having in mind sufficiently what the girls were to do afterwards. As 90% of them ultimately are in charge of homes, education should enable them to be good wives, good mothers, good home managers. The curriculum for girls ought to be threefold: On one line the study of English, which should consist very largely of reading, with the object of giving girls a liking for reading good matter and also something to occupy their leisure in a satisfactory way. On the second line they should have lessons on home-management, including personal hygiene and management of the home generally with certain associated lessons in good household cookery, laundry work, etc. The third line should be handicraft with its basis in needlework, built upon which there might be simple dressmaking, etc. With a curriculum of that kind, girls between 12 and 14 could be made good home managers.

EDUCATION ONE COMPLETE PLAN.

Education had in the past been dealt with as so many distinct sections—elementary, secondary, technical, etc., whereas it is simply one complete thing, with each section running very smoothly into the other. In Leeds they had tried to secure the influence of the primary school teacher in helping suitable boys and girls to go forward into Trade Schools and also to go on to evening schools without wasting any time. Absence from school causes loss of power, of concentration of thought and application; hence the effort to have pupils come direct from the elementary to the evening school without an undesirable break. All that can be done to break down the barrier between the ordinary day school and the Technical School would be an advantage to the student and to the community. Another development was to secure the interest and co-operation of the employer of labor, who unfortunately now looks on the

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whole of his business simply as a commercial thing, as a matter of getting good dividends, the exception being to find one who looks on the employee as a human being who needs assistance in the way of education. A few employers have assisted their employees to enter Technical Schools. What is wanted is to get the employer to feel that in his business he needs boys who have taken a certain amount of technical instruction.

SECURING PARENTS' INTEREST.

Another line of development is to secure the interest of parents in education. Unfortunately now the parent is keen to get the child away from school at the earliest possible moment, and looks on education as something that must be done, but something that he would rather had not to be done. No doubt many parents need the money that can be earned by the children, but they do not seem to be able to look beyond the few shillings of earnings. Crowds of boys are leaving day school for various employments which give them a fair wage for three or four years; then when the boy is becoming a man and wants more wages he has to leave, and some younger boy from the Technical School takes his place, while the untrained boys go to swell the army of casual workers, and finally a large number of them get into the ranks of the unemployed.

Recently an Advisory Committee for Juvenile Employment has been appointed with two important functions. The first is to give the child, and the parent wherever possible, advice as to the child's employment. It is hoped a large percentage of parents will take advantage of such advice and put their boys into employment which will likely be lasting, and not throw the boy on the streets in three or four years. The Committee will also watch the boy or girl after getting into work, and encourage them to take advantage of an opportunity for further education.

SECTION 4: HOLBECK DAY TRADES PREPARATORY SCHOOL.

This School was opened in 1906. The building was at one time a Mechanics' Institute, but has been altered and refitted in a simple manner with suitable machinery and apparatus. The lathes are driven by foot power.

Any boy of 13 who has attended an Elementary School regularly is eligible for admission. The course of instruction is calculated to answer two very useful purposes: (1) the hand, eye and brain are trained on sound common-sense lines with a view to the ultimate employment of the boy in some branch of engineering; (2) the boy has many opportunities of observing and taking part in different kinds of work and processes. His interest is aroused and stimulated. He competes with his class fellows, and often develops ability in quite unexpected directions. By this means the boy is encouraged to select some particular branch and to some extent to specialize thereon, with a view to following it up in the works. When the time comes for him to be drafted into the particular shop

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or office selected, he goes with a clear understanding of what is before him and with a mind fully prepared to master all the intricacies of his craft in record time. The leading local employers are in full sympathy with the aims of the school, and evidently the time is not far distant when a full preparatory trade course will be an essential qualification for entry into the better class engineering works.

The course of instruction covers 2 years, and is laid down with the object of improving the general education, developing common-sense and reasoning power, and enabling a boy to acquire the necessary manual dexterity to ensure that he shall be put at once on useful work when he enters the shops.

An undertaking is required from parents that boys will not be withdrawn in less than one year, but they are allowed to go whenever suitable openings to lucrative positions occur. The school authorities prefer that the lads should stay in this school at least a year and a half. The teachers take a personal interest in the lads, and are continually on the look out for places for them.

The attitude of the students was noticeable for earnestness, interest and keenness.

Our Commission secured specimens of the boys' work in this school. These include patterns, castings made therefrom, fine tools, work in tin, etc., The workmanship is excellent as to accuracy and finish.

PLAN OF INSTRUCTION.

The instruction is divided into three sections, each receiving about the same amount of time, viz:; English subjects, Mathematical subjects, and Shop practice.

The scheme of instruction for the first year is as follows:—

Mathematics (Practical).....	5	hours	per	week.
Mechanics.....	3	"	"	"
Technical Drawing.....	4 $\frac{1}{2}$	"	"	"
Metal-work.....	6	"	"	"
Wood-work.....	2	"	"	"
English.....	6	"	"	"
Drill.....	1	"	"	"
<hr/>				
	27 $\frac{1}{2}$	"	"	"

Visits to works, rambles, etc., are also arranged.

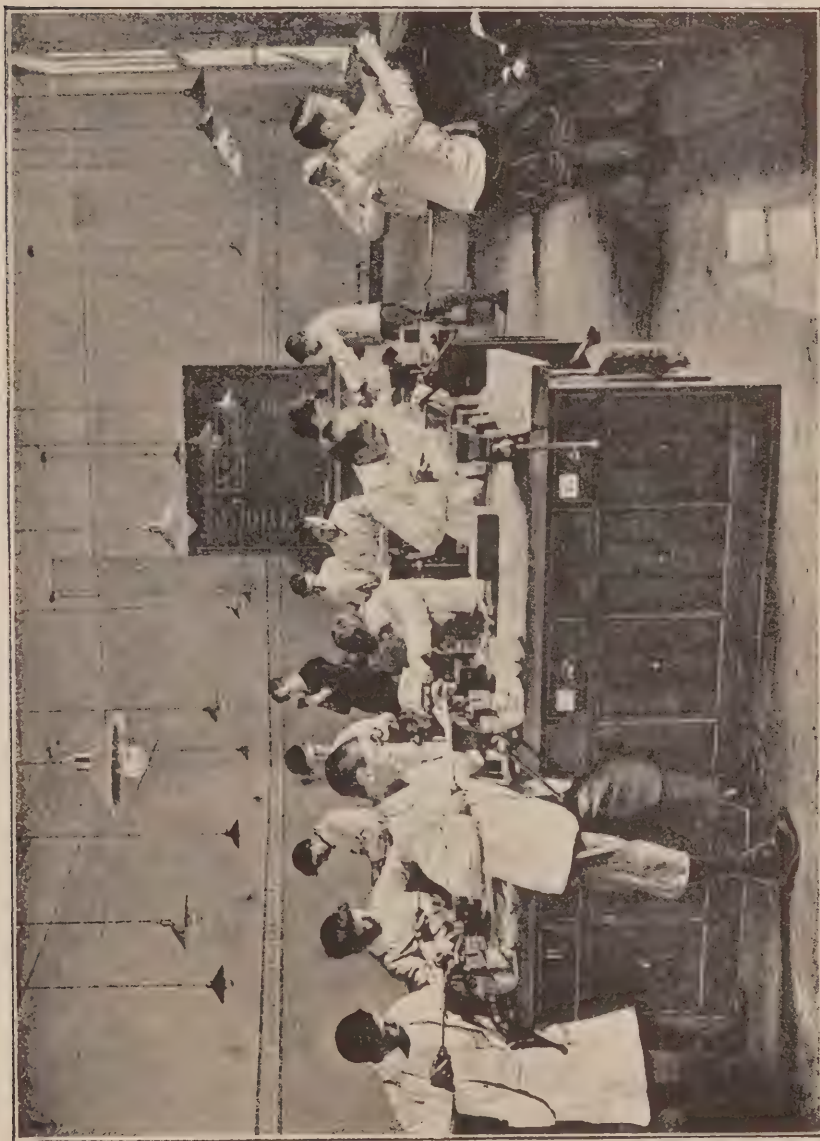
The second year's Course is arranged on similar but more advanced lines, and students of exceptional promise are encouraged to specialize in their work.

SYLLABUS OF WORK.

Practical Mathematics.—Revision of Vulgar and Decimal Fractions, English and Metric Units of Measurement, Methods of Conversion, Mensuration, Application to Workshop Problems, Contracted Methods, Averages, Percentages, Simple Algebraic Expressions, Formulæ, Ratio and Proportion, Equations, Graphs, Logarithms, &c.

Mechanics.—Experimental Verification of Simple Laws, Practical Determination of Areas, Volumes, and Weights, The Balance, Mass and Weight, Displacement, The Principle of Archimedes, Density, Simple Calculations on Force, Work, Power, Horse Power, &c.

Principle of Moments, the Lever, Pulley Blocks, Wheel and Axle, Triangle of Forces, with practical applications.



METALWORK SHOP: HOLBECK DAY TRADES PREPARATORY SCHOOL.



MECHANICAL LABORATORY: HOLBECK DAY TRADES PREPARATORY SCHOOL.



WOODWORK SHOP: WOODHOUSE DAY TRADES PREPARATORY SCHOOL.

3 GEORGE V., A. 1913

Short Lectures are given on the above subjects, and the student, by means of actual experiment in the laboratory, *finds out for himself* the important principles involved.

Technical Drawing.—The care and correct use of Drawing Instruments, the principles of Practical Plane and Solid Geometry, including graphic solution of problems. The method of making dimensioned hand sketches of simple machine or building details from actual examples. The preparation of working drawings, Tracings, and Blue Prints.

Metal Work.—Uses of ordinary Bench Tools. Principles of accurate Measurements and Gauging. The Lathe, Drilling, Punching, and Shearing Machines. The Forge, Soldering and Brazing.

Practical Examples involving Filing, Fitting, Screwing, Drilling, Turning, Soldering, &c.

Lessons on the physical properties of Metals, Cast-Iron, Wrought-Iron, Steel, Brass, and other alloys. Hardening and Tempering, Case-hardening. Workshop Processes.

Woodwork.—The use of the ordinary Wood-working Tools, the Wood-turning Lathe and its accessories, useful Joints in Woodwork. The Elements of Pattern-making, simple Patterns, Core Prints, Core Boxes, &c.

English and Geography.—Reading and Spelling. Correct use and meaning of Technical Terms. Clear Expression of Simple Ideas. Lecture and Laboratory Notes, Essays, Letter writing. Industry and Trade Materials used in Construction, where obtained, general Distribution, &c.

Drill.—Physical Exercises, Dumb-bell and Bar-bell Drill, Swimming, &c.

The attention of Parents and Guardians is called to the following points:—

(1) 90% of the boys who have completed the 2 years' course at this school have entered skilled occupations either as draftsmen, mechanical or electrical engineers, or some branch of the building trades.

(2) An undertaking is required on admission that a student shall not be withdrawn within one year except with the consent of the Committee.

(3) Regular and punctual attendance is essential. In case of lateness or absence a note of explanation is expected from the parent.

(4) Home lessons of about one hour's duration will be set regularly, and it is expected that these will be carefully and systematically prepared.

(5) The Head Master may be consulted at any time during school hours, or by appointment.

(6) The Fee is 7s. per term payable in advance.

(7) All necessary books, apparatus, stationery, tools, etc., are supplied free of charge.

SECTION 5: TECHNICAL EVENING SCHOOLS.

The organization of Evening work in Leeds follows five main lines:—

I. Technical and Technological Education and Training.

II. Commercial Education and Training.

III. Art Instruction and Training.

IV. Domestic Arts Education and Training.

V. Training Courses for Teachers of all grades.

TECHNICAL AND TECHNOLOGICAL EDUCATION AND TRAINING.

The evening work has been co-ordinated and systematized. It follows a continuous line from the general Evening Schools, through the Branch Artisan Schools and the minor Mechanics' Institutes, to the Advanced Technical Schools,

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situated in the Centre, South, and West of the City, and ends in the University of Leeds, thus:—

Grade I.—General Evening Schools (Preparatory Courses).

Grade II.—Holbeck Mechanics' Institute, Hunslet Mechanics' Institute, Woodhouse Mechanics' Institute, Wortley Working Men's Institute, (Elementary and Intermediate Courses). Branch Artisan Schools (Elementary Courses).

Grade III.—Central Technical School (The Leeds Institute), Cockburn Technical School, West Leeds Technical School (Advanced and Honours Courses).

Grade IV.—The University of Leeds (Special Lecture and Honours Courses).

The scheme of evening work provides complete courses of instruction and training for persons engaged in,—

- (1) Engineering Trades.
 - (a) Mechanical Engineering.
 - (b) Electrical Engineering.
- (2) Electrical Industries.
- (3) Building Trades.
- (4) Sanitary Work.
- (5) Leather and Boot Trades.
- (6) Clothing Trades.
- (7) Chemical Industries.
- (8) Bread Making and Confectionery.
- (9) Mining.
- (10) Textile Industries (Woollen, Worsted, Linen, &c.).
- (11) Printing.

The courses of study in all branches are of a practical character, and the instruction is in charge of experienced teachers specially qualified in their respective subjects.

Grade I.—General Evening Schools.

Preparatory sections for youths and men are attached to the various Branch Artisan Schools where necessary.

The General Evening Schools meet three times weekly, from 7.30 to 9.30 p.m.

The course of instruction in the Preparatory Schools is specially arranged to prepare pupils later to take up with advantage one of the various trade courses provided in the Branch Artisan Schools or in the Central Technical Institutes. It gives a thorough grounding in fundamental subjects:—English, Mathematics, Hand Sketching and Instrumental Drawing, Woodwork, or Wood-carving, including Clay-modelling—without which it is useless for pupils to attempt any of the trade courses.

A higher fee is charged a pupil who does not take a grouped course.

Grade II.—Branch Artisan Schools.

The course includes Experimental Mathematics, Practical Mathematics, Practical Plane and Solid Geometry and Hand Sketching, English, Mechanical Laboratory work.

Fee for course, 50c.; higher for those not taking group course.

Grade III.—Advanced Technical Evening Schools.

At the Advanced Technical Evening Schools, courses of instruction have been arranged for persons engaged in:—

- (i.) Engineering Trades—
 - (a) Mechanical Engineers.
 - (b) Electrical Engineers.
 - (c) Motor-car Engineers.
- (ii.) Electrical Industries—
 - (a) Wiremen and Linemen.
 - (b) Post Office and Telephone Clerks.
- (iii.) Building Trades and Professions—
 - (a) Carpenters and Joiners.
 - (b) Bricklayers and Masons.
 - (c) Plumbers.
 - (d) Surveyors.
 - (e) Architects.
- (iv.) Sanitary Work—
 - (a) Inspectors of Nuisances.
 - (b) Women Health Visitors.
- (v.) Leather and Boot Trades—
 - (a) Boot and Shoe Manufacture.
 - (b) Leather Manufacture.
- (vi.) Clothing Trades—
 - (a) Tailors' Cutting.
 - (b) Practical Tailoring.
- (vii.) Chemical and related Trades—
 - (a) Chemists:—Works Chemists, Analytical Chemists, **Pharmaceutical** Chemists.
 - (b) Bakers and Confectioners.
 - (c) Photographers and Process Workers.
 - (d) Oil and Soap Workers.
 - (e) Gasworks Employees.
 - (f) Metallurgists, Iron and Steel Workers.
- (viii.) Textile Trades.
- (ix.) Printing.
- (x.) Farriery.

Courses are provided also in Botany, Geology, Physiology, Hygiene, &c.

Grade IV.—The University of Leeds.

Special courses for advanced students in Mechanical and Electrical Engineering, Leather Manufacture, Mining, Textile Industries and Dyeing. An attendance of six hours a week throughout the session is required, unless for special causes.

Fee \$2.50 for each group course.

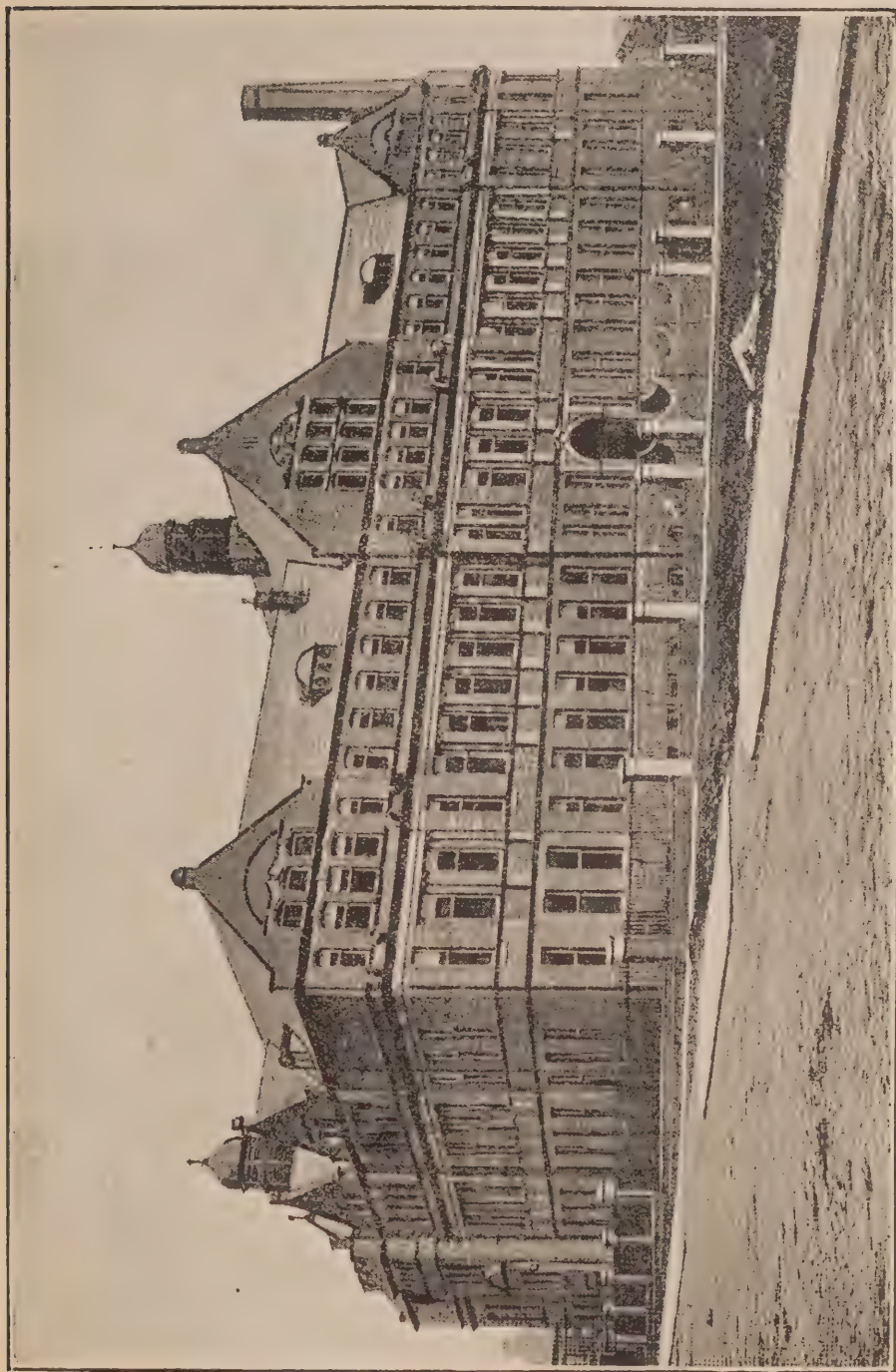
COMMERCIAL EDUCATION AND TRAINING.

The work in commercial education and training has been co-ordinated and systematized. It follows a continuous line from the General Evening Schools, through the Branch Commercial Schools, to the Advanced Schools of Commerce, and ends in the University of Leeds, thus:—

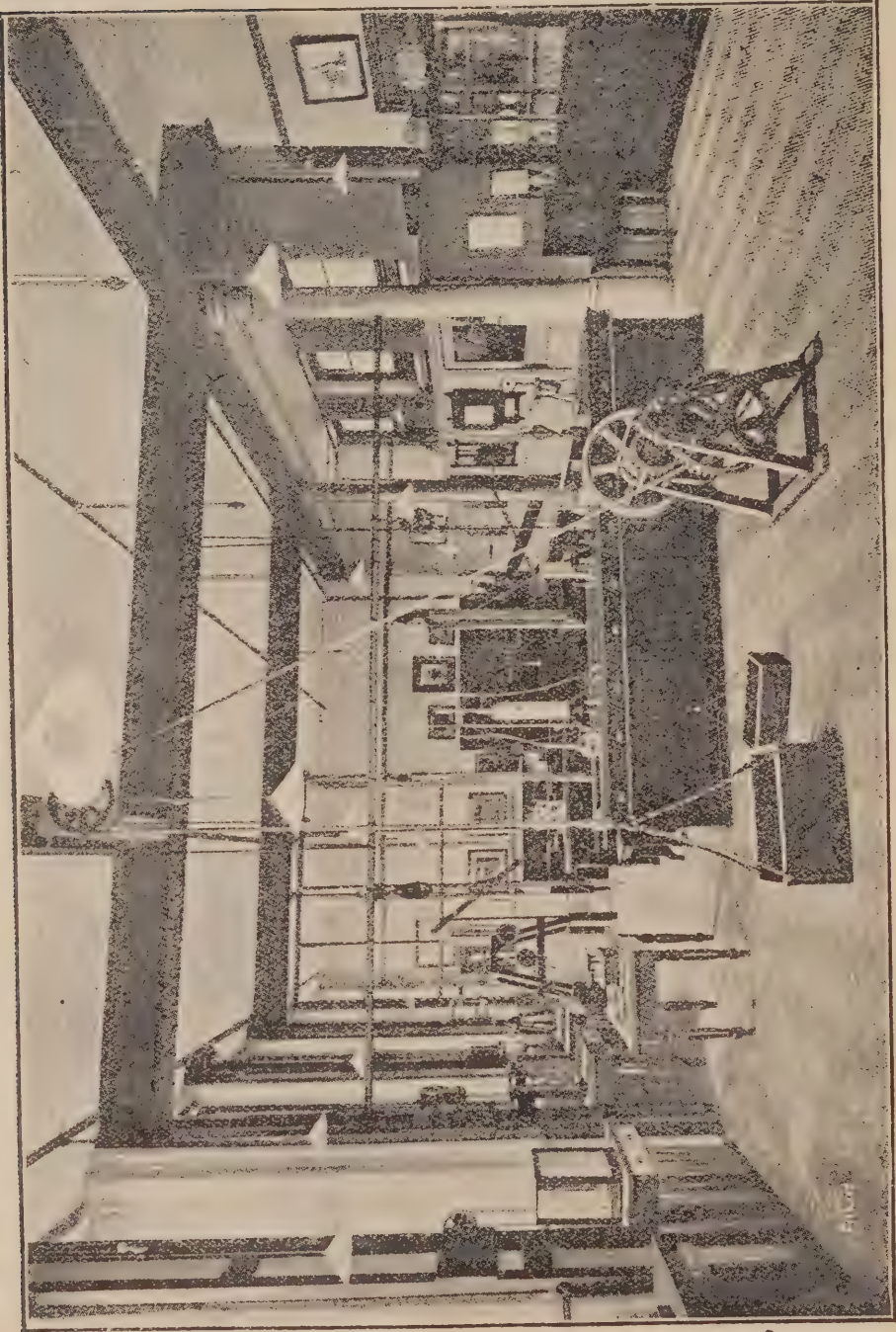
Grade I.—General Evening Schools (Preparatory Courses).

Grade II.—Branch Commercial Schools (Elementary and Intermediate Courses).

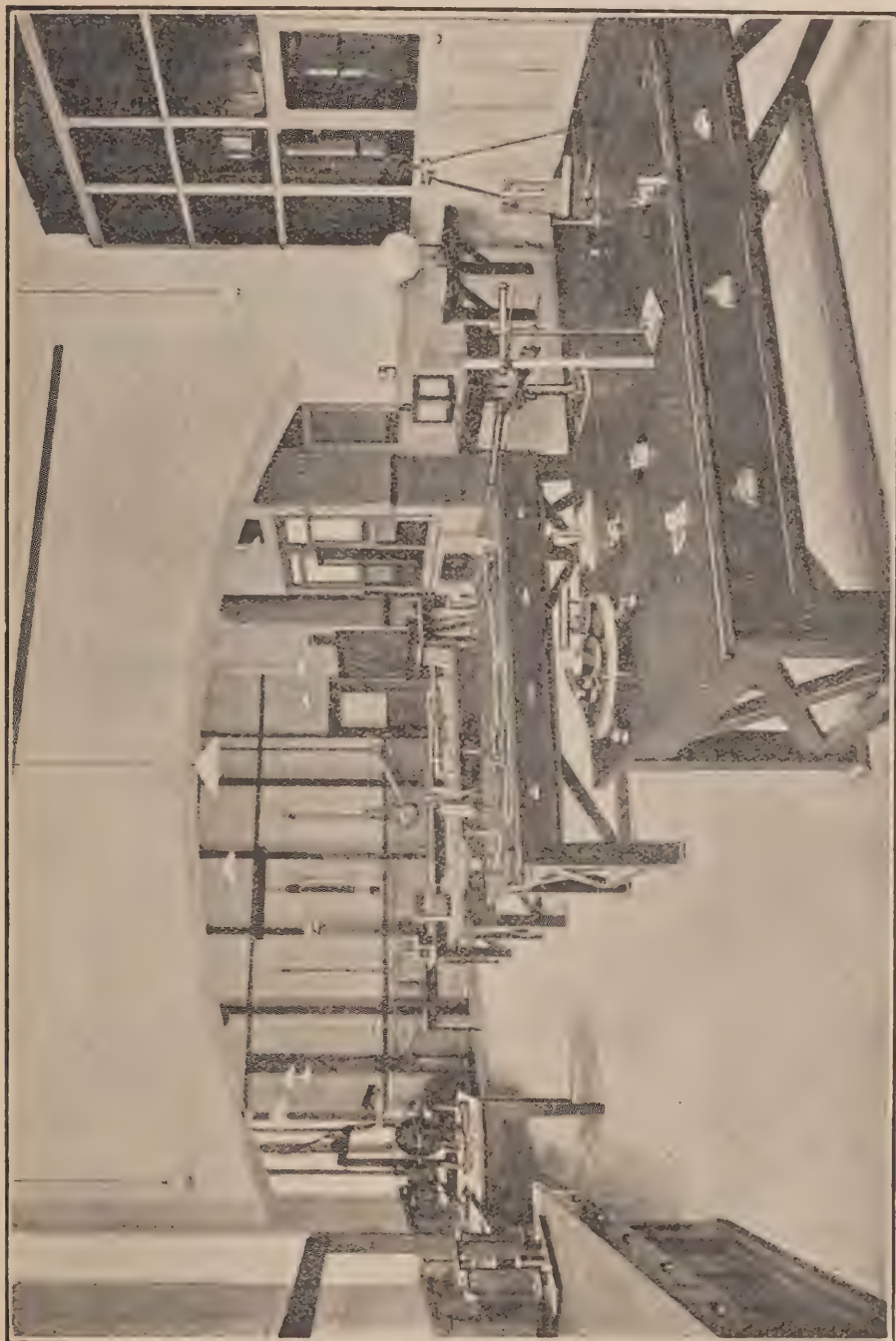
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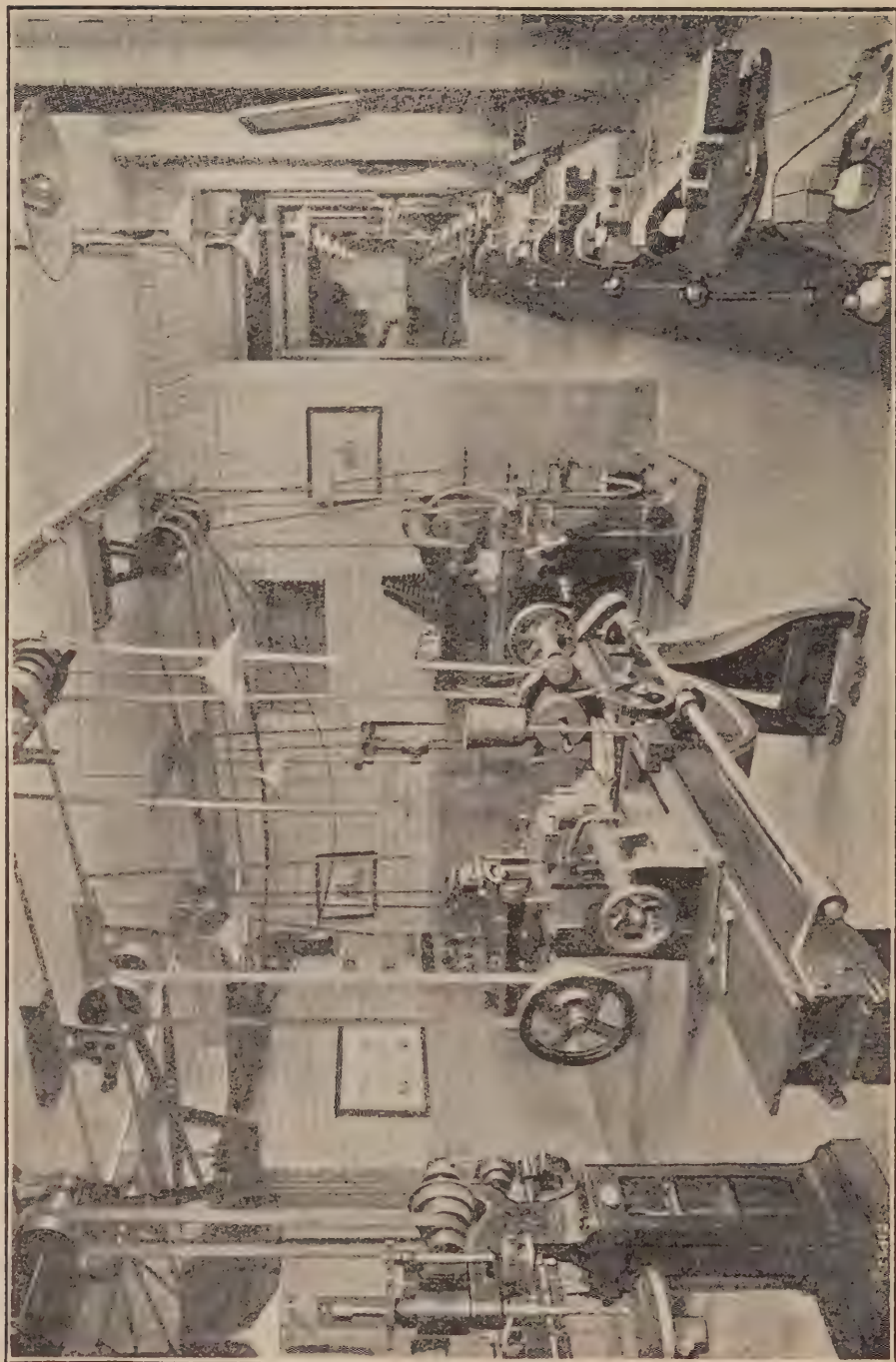
COCKBURN HIGH SCHOOL; LEEDS.



COCKBURN HIGH SCHOOL: MECHANICAL LABORATORY.



COCKBURN HIGH SCHOOL: ELEMENTARY PHYSICAL LABORATORY.



COCKBURN HIGH SCHOOL: ENGINEERING WORKSHOP.

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Grade III.—Central School of Commerce (Central High School), Cockburn School of Commerce (Cockburn High School), Western School of Commerce (West Leeds High School), Intermediate, Advanced, and Honours Courses.

Grade IV.—The University of Leeds (Special Lecture Courses).

In the comprehensive scheme of commercial education for the City, opportunities are provided for young persons who intend to follow a commercial career to obtain a complete and intelligent knowledge of all branches of commercial practice and to secure such training as will fit them for the highest positions in the commercial world.

The courses of study are of a thoroughly practical character, and in schools of all grades specially qualified teachers have been appointed to take charge of the instruction.

SCHEME OF EVENING TECHNICAL COURSES IN COMMERCE.

<i>Preparatory.</i>	<i>Elementary.</i>	<i>Intermediate.</i>	<i>Advanced.</i>	<i>Honours.</i>
1. English and Pre-cis.	1. English.	1. Commercial Arithmetic.	1. Commercial Practice and accompanying Arithmetic.	1. Accountancy and Commercial Practice, Importing and Exporting under various conditions.
2. Handwriting Figuring.	2. Commercial Arithmetic.	2. Commercial Practice.		
3. Arithmetic and Mensuration.	3. Commercial Practice.	3. Book-keeping	2. Advanced Book-keeping.	2. Banking and Currency.
4. Geography and History.	4. Commercial Geography.	4. Commercial Geography and History	3. Banking and Currency.	3. Commercial Economics.
5. Drawing.	5. Shorthand.	4. English and Shorthand (with Type-writing) or Foreign Language.	4. Commercial History and Economics.	4. Commercial Law.
			5. Foreign Language.	5. Foreign Language or Shorthand and Type-writing.

There are courses for Municipal Officers, Bankers, Grocers and Provision dealers, also lectures on Citizenship.

ART INSTRUCTION AND TRAINING.

This section is dealt with under Chapter XI on Drawing, Design and Art.

DOMESTIC ARTS.

The work as a whole has been co-ordinated and correlated. It follows a continuous line from the General Evening Schools for girls, through the Branch Young Women's Institutes, to the Central Institute for girls and women.

The group courses aim at imparting a thoroughly useful knowledge of domestic and general subjects. The various schools are provided with well-

equipped Cookery rooms, Needlework and Dressmaking rooms, Starching and Ironing rooms, Laundry, etc.

Students in Dressmaking and Millinery should usually have received prior instruction in Plain Needlework.

Students must provide their own materials for Plain and Art Needlework, Dressmaking and Millinery classes, subject in each case to approval of teacher. Students taking Needlework and Dressmaking are strongly advised to attend a special Course in Art as applied to Needlework and Dressmaking. Students taking Cookery might with great advantage enter for a Course in Elementary Science in preparation for or in conjunction with a Course in Hygiene and Home Management.

As an alternative, but one considered likely to be less effective, the full course may be organised in two divisions; — (a) Hygiene and Home Management, Household Accounts, Cookery and Laundry; (b) Drawing and Design, Needlework, Dressmaking, and Millinery. A student should in this case devote at least two years to the work of one division before passing to the other. In Division (a) Hygiene and Home Management and Household Accounts should be taken for the first two years, generally with only one of the subjects, Cookery or Laundry; in Division (b) Needlework, and Drawing and Design should be taken for two years with one of the subjects Dressmaking or Millinery.

At the Central Institute there is an excellent series of class-rooms and specially equipped workrooms for Needlework, Dressmaking, Millinery, Cookery, and Science work in connection with the Domestic Arts. A staff of specialists and highly qualified assistants has charge of the classes. The fee per session for each class is \$2.50, or \$3.75 if two subjects are taken.

SECTION 6: TRAINING COURSES FOR TEACHERS.

The City of Leeds has provided a Training College through which to obtain a supply of thoroughly trained teachers for its schools. A few facts regarding this College are stated to illustrate the character of the provision being made.

The College is for men and women who intend to become teachers in Public Elementary Schools, and is conducted under the regulations of the Board of Education (London) for the Training of Teachers for Elementary Schools (two years course). The Governing Body of the College is a Subcommittee of the Leeds Education Committee.

A fine old estate containing an elegant manor-house was purchased, and subsequently additional land for playing fields was obtained, making the total extent of the Training College estate now over 90 acres. There is a fine garden for Nature Study, Gardening, Fruit Culture and Botany, and also good kitchen gardens. The estate is on rock covered with a few feet of good soil, and contains a good water supply within its boundaries. It is easily approached from the University and the Leeds School of Art, from the markets, and from schools of all types.

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One of the most pleasant features of the site is the extensive woods through which walks ramify in various directions. Trees are scattered about the estate, and provide ample shade for outdoor reading in summer time.

The new buildings, which were in progress of construction at the time of the visit of the Commission, consist of an Educational Block, together with 8 Halls of Residence—3 for men and 5 for women; and provide accommodation for 480 students—180 men and 300 women. There are in addition a Sanatorium, Swimming Bath, Laundry, and Games Pavilions.

The Halls of Residence are arranged in order to stimulate as far as possible the home feeling rather than the institutional feeling. Each student is provided with a study bedroom, so furnished that during the day it has the appearance of a sitting room. In addition to these private rooms, each Hall possesses its Library, Dining Room and Common Room. Students therefore have the advantage of privacy in work and also of opportunities of corporate life.

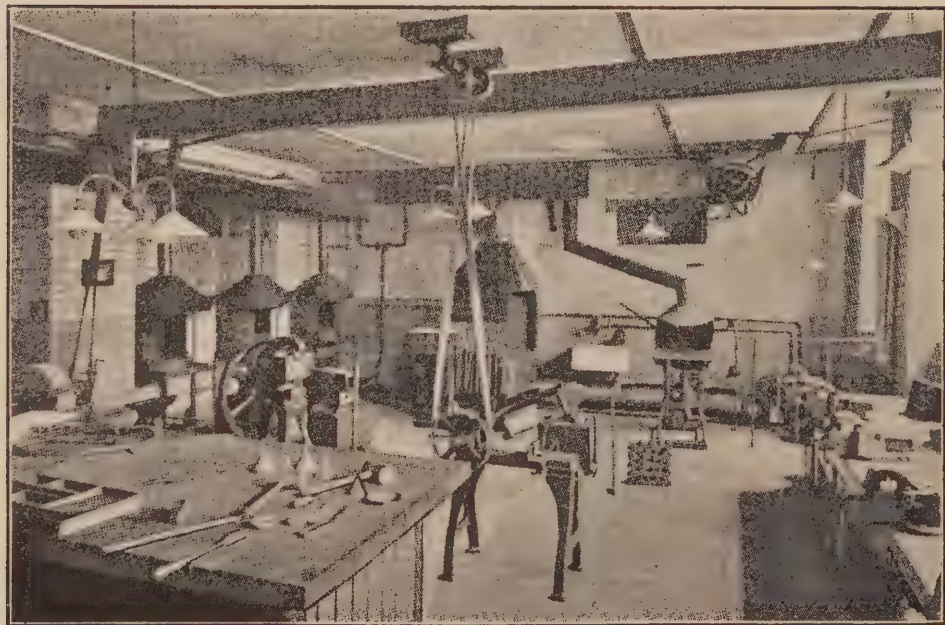
SECTION 7: UNIVERSITY OF LEEDS.

Begun in 1887 in the rising City of Leeds as Yorkshire College, and affiliated to Victoria University, the University of Leeds was, with Owen's College, Manchester and University College, Liverpool, in 1904 converted into an independent University. Its evolution had been gradual, from a Science & Technology School in 1874. Each of these was made into a Faculty. The Faculty of Arts was added in 1877, and Medicine in 1881. It has been a remarkably energetic and successful training school for scientific workers. Its successful application of chemistry to leathermaking and its complete sympathy with the industries of Leeds are well known abroad. It has gained a great reputation also in Textile Industries and Dyeing (Chemical). In its four Faculties,—Arts, Science, Technology and Medicine, it has a staff of 37 professors, 21 lecturers and 62 assistants, totalling 120, who successfully taught in 1908-9 its band of 932 day students, 64 occasional students and 28 post-graduate Students, of whom 378 were taking Pure and Applied Science. Besides these, there are Evening Classes, attended by 233 students from the industries of the City.

A strong feature of Leeds University is that it has Advisory Committees of leading business and professional men and manufacturers for each of its main Departments. The chief of these Committees are,—Finance, Textile Industries & Dyeing, Mining Engineering, Leather Industries, Elementary & Secondary Training, Coal Gas & Fuel Industries, Higher Commercial Education, Agricultural, University Extension.



MACHINE DRAWING ROOM.



COCKBURN HIGH SCHOOL: THE FORGE.

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COOKERY DEMONSTRATION ROOM.



COCKBURN HIGH SCHOOL: ART ROOM.

CHAPTER IX: HALIFAX.

SECTION 1: CONVERSATION WITH DR. J. CROWTHER.

Information obtained in "Conversation" with DR. J. CROWTHER, Principal of the Municipal Technical College.

Halifax is a city of 100,000 with a variety of industries, chiefly woollen mills, dye works and engine works. A large number of half-timers work in the textile mills in the morning and attend school in the afternoon, or *vice versa*. They are allowed to commence as half-timers at 12, and generally work that way for a year. At 13 they are allowed to discontinue school, provided they have made not less than 350 attendances a year for 5 years consecutively. They are not allowed into the workshops until 14. In the worsted mills there is not a living wage, *i.e.*, 21s. a week, when they attain manhood, for more than one out of eight of the boys who start as half-timers. Others may become overlookers or such, and there are positions where they may earn 30, 35, or 40 shillings; but even at 21s. the employers would be glad to get rid of the men who are doing boys' work. Hence the endeavour must be to guide these boys from the textile mills. That was one of the principal things that led to the establishment of the Preparatory Trade School, where all are prepared for different industries.

When boys leave school, they are visited at their homes and advised to go into the Evening Schools. Every week the City Education Office sends to the Technical College the names of all pupils leaving school that week. A clerk is detailed to visit each boy's home, taking a syllabus of the Evening School and explaining what is done there, and the benefit of it to any vocation in which the boys are engaged. In some occupations, such as a greengrocery, the boy's tendency is to sever his connection with education altogether, because he works at night.

65 PER CENT OF BOYS JOIN EVENING CLASSES.

In Halifax there are 70 or 80 solicitors who have office boys simply for opening doors, stamping envelopes and posting letters, and when those boys reach 16 or 17 there is nothing suitable for them. This College therefore tries to get hold of these lads and to find them suitable positions, and if possible guide them into them. By personal visits to pupils leaving school a fairly large percentage of them are got into Evening Classes. The clerks who visit these students have had experience of going through the classes themselves, and they can usually handle all cases, but when anything exceptional arises the Principal makes a personal visit.

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When positions are obtained for boys in that way, they go to Evening Class, not to Day School. The clerks who visit the homes go through the preparation of examination papers, seeing to the questions, answers, etc. When the clerk visits the young people, he cannot promise them places but can simply say what has happened to others.

A feature about the Evening Schools is that without exception the vocational commercial teachers started in the Evening School as students. They are clerks in offices who, having gone through the commercial course in the College, have come back as teachers. The same remark applies to dressmaking and millinery.

These classes are practically free, as the fee is returned on the pupil making 90% of possible attendances. It is difficult to find such attendances and such homework in any other place in England. About 65% of those who leave Day School attend Evening Classes. A special effort was made to ascertain what was possible in that matter, and it was found that 15% could not stand the pace; another 15% were undesirables, who might have been defective in Day Schools, or have had other illnesses. At one particular period a big effort was made, and over 80% were got into the schools, including boys and girls. The big transition from the Day School, of five and a half hours per day and no homework, to 50 hours per week in the mill is to be considered.

CO-OPERATION OF EMPLOYERS.

Employers will help very much so long as the plan does not touch their pockets, some being very enthusiastic about the College and always praising it sky-high; but if it costs them two or three shillings a week, that is different. There is not the same necessity for canvassing employers in Halifax as in most towns, because the Educational Authorities keep in close touch with the students from the time they leave school. In all the textile mills and engineering shops the school has a big poster outlining the classes at the beginning of each session. The Chamber of Commerce gives prizes, and this has a very beneficial effect on the pupils, because it represents the employers of the town. Each year the Chamber awards 4 gold and silver medals, 8 bronze medals, and about £20 in money prizes, and there is invariably a large number of employers present at the prize distribution. The engineering employers, through their Federation, offer prizes and medals and money each year to the most successful students in the Engineering Section.

The house painters take a very deep interest and supervise the work, adjudicating upon it, etc. They used to give prizes, but there was a disagreement with the School, as the painters wanted to award prizes on what the School considered the purely mechanical side, as apart from the artistic, and to make their prizes dependent upon marbling and graining—purely mechanical arts—and time tests, while the School wanted a more artistic course whereby the students would go into such work with a tendency towards a general uplift. The painters therefore continued to do their work, but were relieved from giving the prizes.

Employers allow the school representatives to go into the works and distribute circulars during working hours. There is no place in Halifax into which

the Principal could not go at any moment and speak to the apprentices, and Mr. Crowther did not think there would be any objection to his taking a class in and showing them around the works. One large engineering firm offers to pay the whole of the fees for their apprentices, and there is no direct opposition on the part of the employers.

PREPARATION OF APPRENTICES.

Mr. Crowther pointed out that this is not really a trade school at all, but simply leading up to a trade and supplementing shop experience—quite a distinct thing altogether. To him it was an ideal scheme for young boys in a country such as Canada, attempting to develop its industries. In Halifax no attempt is made to teach trades but what is claimed is that after students have left the school they are specially intelligent apprentices. Then the schools meet another purpose, that of the limits of specialization, which is fairly prevalent in England. Indeed in engineering industries apprentices cannot get the training they could in old times. The object of this school is to give them an insight into the various sections of the trade, and when they get into the works, they are sufficiently intelligent to be able to pick up very rapidly. Even if a boy is confined to one job he can soon switch off and get into another.

The Incorporated Chamber of Commerce, representing general, textile and engineering employers, passed a resolution strongly in favour of the establishment and development of Preparatory Trade Schools, and the Federated Trades & Labour Council also passed a resolution strongly advocating the establishment and development of Preparatory Trade Schools, and that the schools should be maintained largely by funds from the Central Authority. This addendum was put in because these lads after being trained go everywhere. The President of the Local Branch of the Engineering Employers' Federation expressed unqualified approval of the scheme of preparatory training for apprentices, as admirably meeting a requirement in the engineering trade. He believed the scheme would be of greater advantage locally than some of the higher branches of training, because practically all the youths trained under this scheme can find employment in their own town, as against a very small percentage with the higher and more purely scientific training.

OBJECTIONS TO COMPULSORY ATTENDANCE.

In Halifax the percentage of pupils between 14 and 16 is higher than in Germany, where attendance is compulsory. If small employers in engineering allowed an apprentice to attend in the day time, the machinery would stand still, because apprentices cannot be duplicated and idle time avoided, as in large concerns. Another difficulty in regard to compulsory attendance is to determine in which branch of industry the apprentice must attend. A plumber with one apprentice would be much more severely hit, because when he goes out on a job, he must take his apprentice with him; that is one of the regulations of the trade. One such plumber in the neighbourhood of Halifax is

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over three miles from the nearest tram; suppose his apprentice is compelled to attend, where is he to go? That is where compulsory attendance would break down; and if these difficulties arise in a County Borough, what must it be in a County area? Then there are a number of seasonal industries, such as housepainting, very busy in summer and very slack in winter. Housepainters let their apprentices come to school in winter for two hours a week without any reduction of wages, because the conditions of the trade favour that; but other industries are busiest in the winter; so that it would be difficult to put compulsory attendance into operation. Lastly, although they might be compelled to come to schools, they could not be compelled to take instruction or benefit by it.

Mr. Crowther differentiated between compulsory education before and after 14, because beyond 14 the student is no longer a child. His opinion was that before many years, England would have compulsory attendance for night schools, but he was against it, he and Mr. Reynolds, of Manchester, being the two great opponents of compulsion; and he would leave no stone unturned to prevent it. "Other countries have compulsory attendance, yet cannot equal what we are doing here in the way of attendance. You can persuade the pupils to come if you take the trouble, but if you are going to sit in the office and simply send out a circular or postal card and let it end there, eliminating the personal equation altogether, then there is no sympathy. On the other hand, if you can get at the boy, you can do a lot of good, not only for his industrial and technical education, but also so far as the moral side of life is concerned."

BETTER TO PUT COMPUSSION ON EMPLOYERS.

Dr. Crowther thought the schools and institutions would have everything to gain by an arrangement requiring employers to give apprentices between 14 and 17 free time from shop work for four to six hours per week, this time to be used in any way the authorities considered advantageous for the boys' development. He did not think there was so much as people make out in the argument about boys being worn out after working hard all day. The difficulty would be to put into practice the plan of taking stated hours. He would prefer taking the time in the morning, even if it came as early as six o'clock. As to the effect of study upon the boys, he said that the classes began in September, and in Halifax in winter time it was dark before six o'clock; there was nothing in town but the music-hall; what was a boy to do? If he had been working a machine all day he was physically tired, but not mentally tired, and the change from the physical shop work to the mental side would be beneficial. Besides, if the boys were not in school, they were at the street corners. If a number of leading employers got into the way of allowing the time off to the boys, it might lead to legal compulsion and that might make it more acceptable. It would be easier to put compulsion on the employer to allow the boy so much time than on the boy to attend, but of course the two would have to go hand in hand. He thought the only drawback about the shop school was its tendency to become too shoppy.

There are no definite instances of employers in Halifax who are increasing apprentices' wages on the ground of their attending night school, as compared with those who do not go, but those who attend get positions in shops over those who do not, because employers recognize that they are more intelligent in the shops than the other class. Many of the most important industries in Halifax are either managed by ex-students of the College, or positions next to the highest are held by such ex-students, and of course that kind of thing is bound to help.

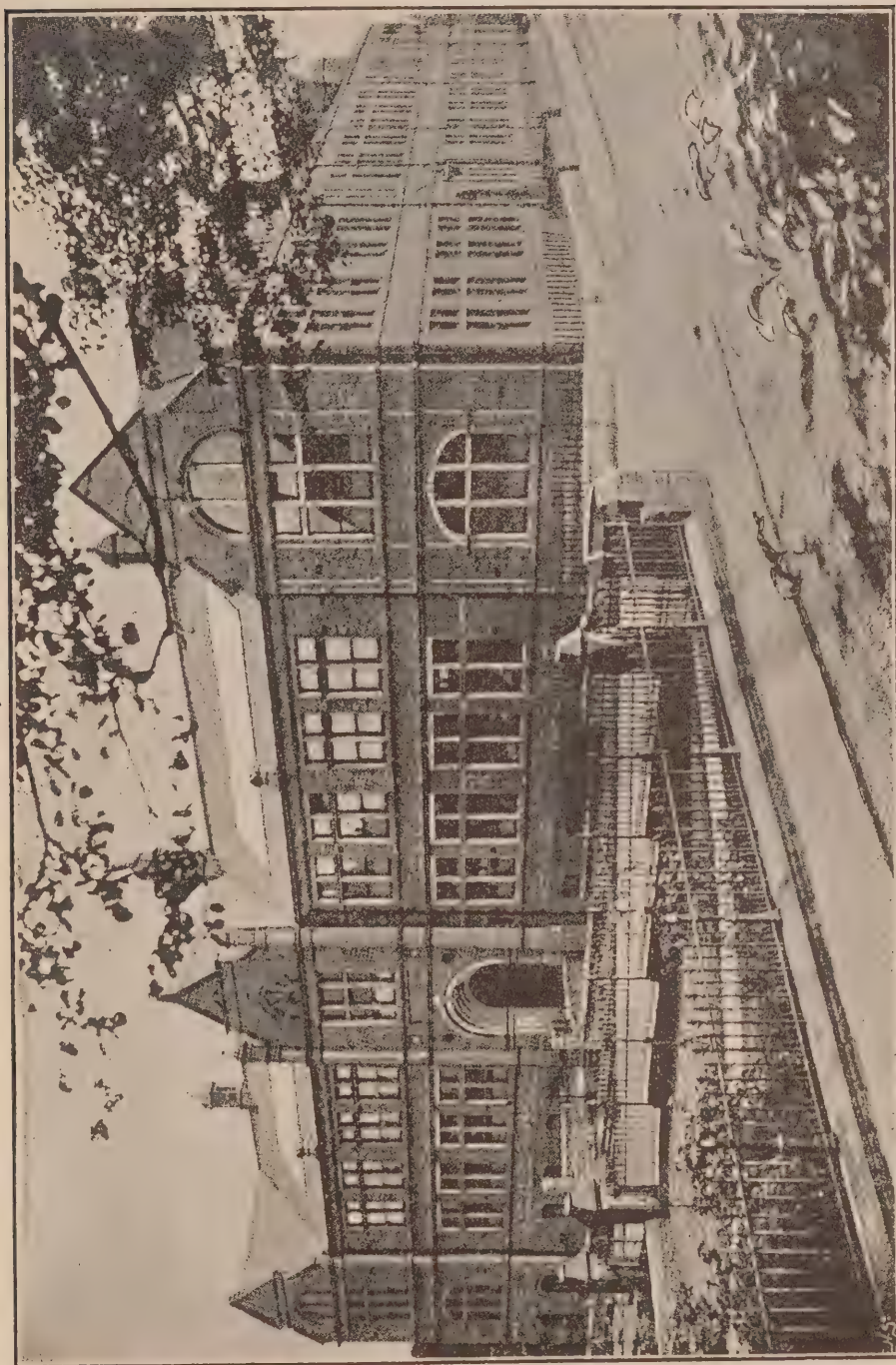
Dr. Crowther referred to the desirability of Elementary School work teaching children to observe and do things, so as to increase the avenues of intake and thus prepare for greater enjoyment of life. In the technical classes practically the whole curriculum is concrete. Observation is trained straight away; history is life-history, geography is almost entirely commercial; and in experimental science work there is observation all the time; a broader mental basis of activity is being given continually.

SECTION 2: MUNICIPAL TECHNICAL COLLEGE.

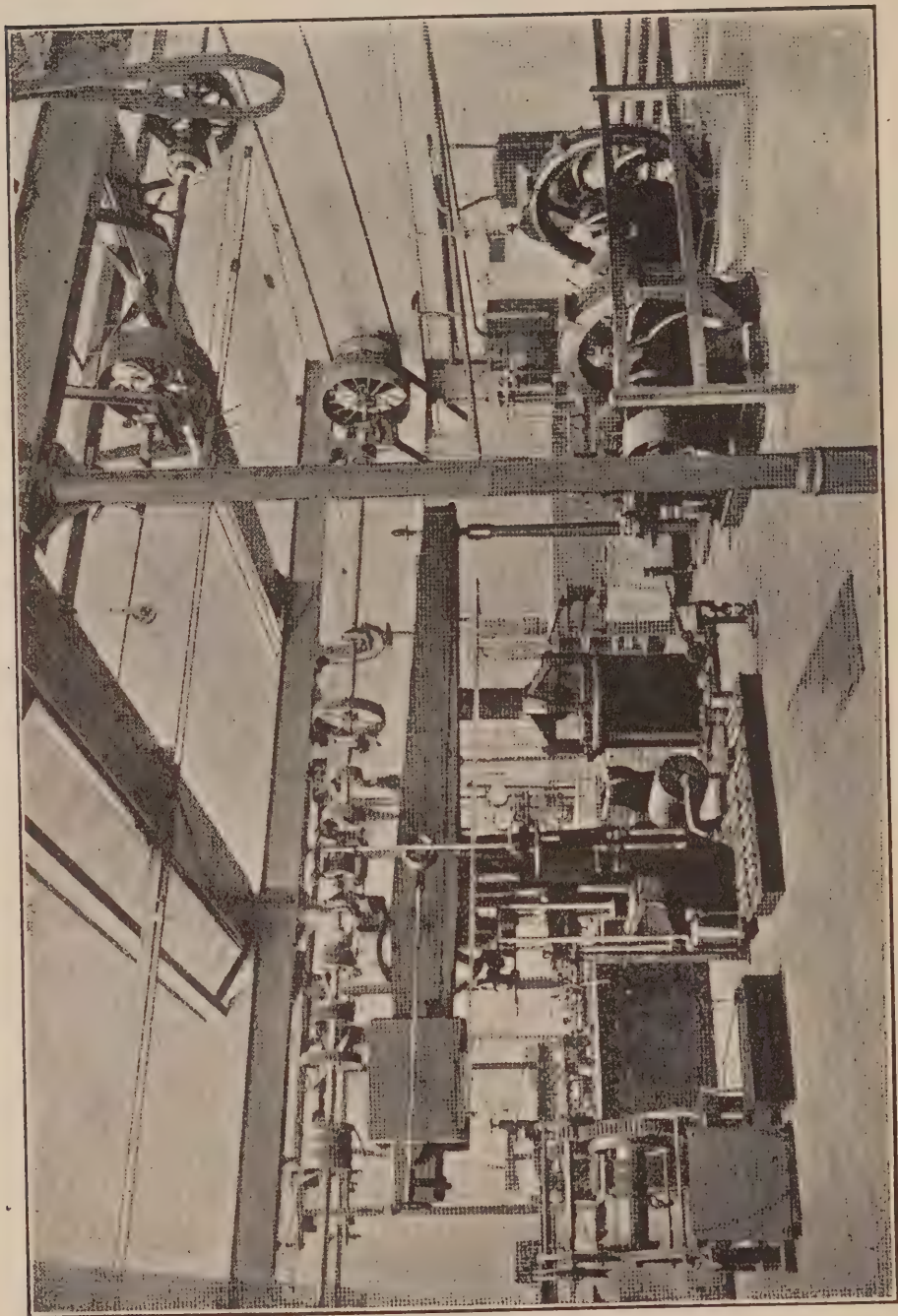
This college costs about £9,000 per annum. The Board of Education (London) grants about £3,000. The College covers the whole field of industrial life from Elementary Schools upwards. Dr. Crowther is strong on the industrial and civic advantages gained through the improvement of the individual. The industrial improvement is very marked through the graduates of the Evening Technical Schools and Colleges being in positions of authority and in charge of works. The teachers are thoroughly competent and experienced in the particular trades, most of them, if not all, having been trained through the Halifax evening classes. One teacher in the evening class was given three guineas per night. He was worth it because he could handle large classes, so that the Imperial Grant on student hours covered the whole cost. The remuneration to evening teachers, according to supply and demand, varied in the same subject from year to year, the usual range being from 5 to 10 shillings per lesson.

Students must satisfy the instructor that they were able to profit by the course offered. No restriction is made in evening classes as to men following trades in the day time. Medals and scholarships and prizes are offered. Cases of students who have been very successful are cited for the emulation of pupils. Students have the personal assistance of the Principal to get out of blind-alley occupations. The teachers are most earnest and enthusiastic men. For example Mr. Turner, the weaver, has had 17 years experience. The earnestness and keenness of students in their work is very noticeable; discipline takes care of itself. The physique of the students is excellent in the different classes. Years of attendance in the technical classes count in cutting off years of apprenticeship. There has been a decided improvement in the cloth trade by means of the College; also in dyeing and patterns, and in the understanding of the use of factory machinery by those who were trained. A number of inventions have been perfected and patented by graduates of the school. Improvements have been effected in the output of the machines by differences in the management of the machine and by the use of common machines for making an uncommon product.

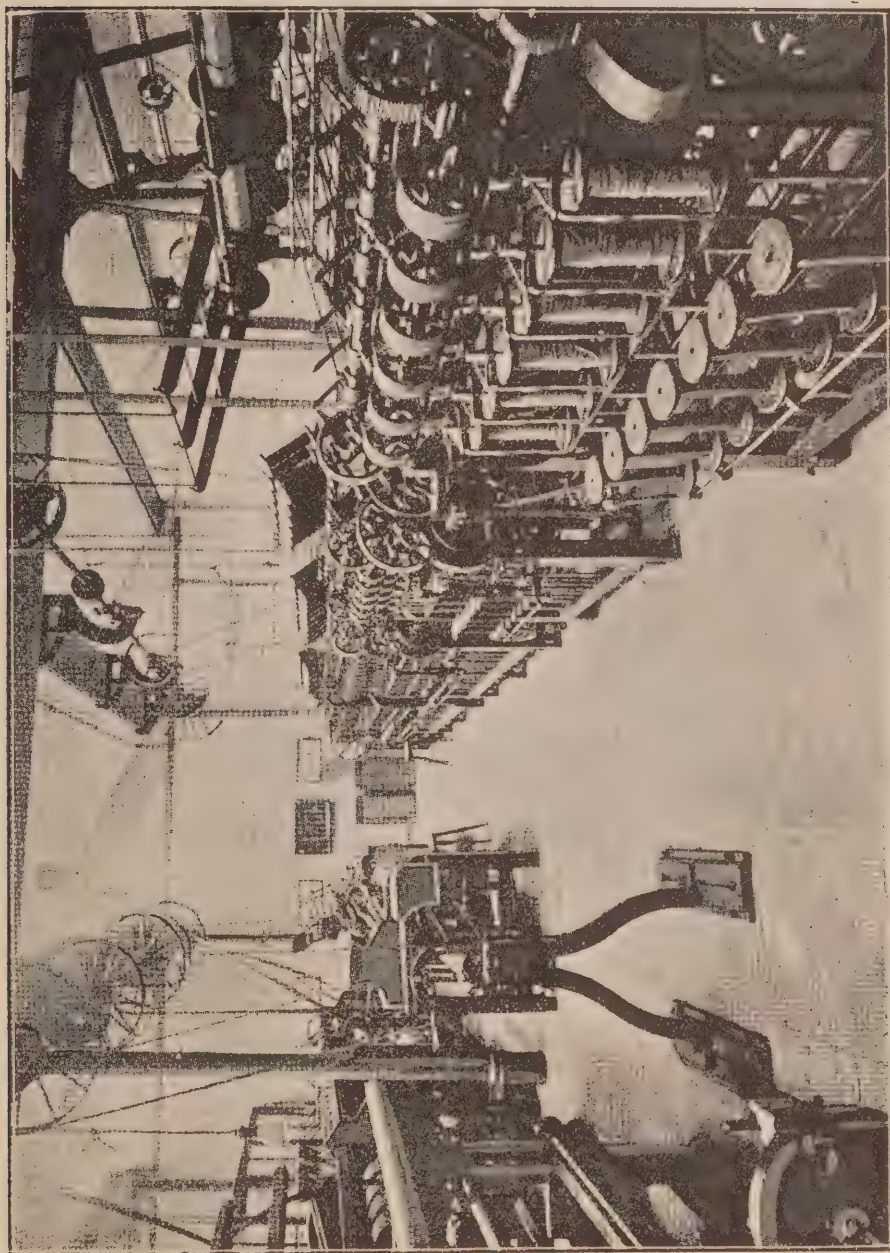
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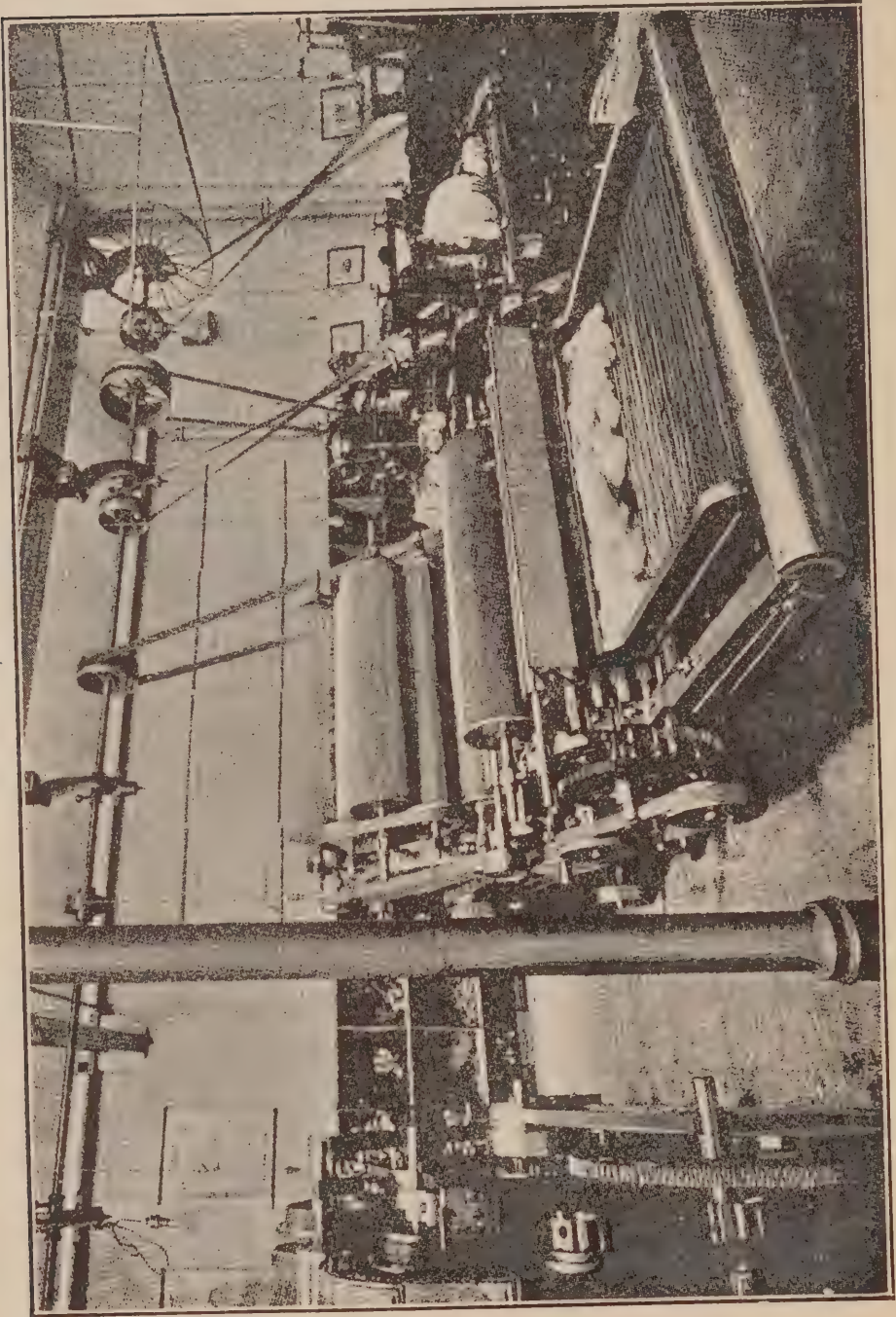
COUNTY BOROUGH OF HALIFAX: MUNICIPAL TECHNICAL COLLEGE.



MECHANICAL ENGINEERING TESTING LABORATORY: MUNICIPAL TECHNICAL COLLEGE, HALIFAX.



CENTRAL PORTION OF THE SPINNING SHED: MUNICIPAL TECHNICAL COLLEGE, HALIFAX.



CORNER OF THE SPINNING SHED: MUNICIPAL TECHNICAL COLLEGE, HALIFAX.

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There has been a change in the attitude of the people towards education. They now appreciate this training and are willing to support it.

SCIENCE AND TECHNOLOGY.

The following courses are given:—

1. Mechanical and Civil Engineering.
2. Electrical Engineering.
3. Motor Car Engineering.
4. Textile Industries.
5. Pure and Applied Chemistry.
6. Courses for University (Science and Engineering) Degrees.
7. Cabinet Making.
8. Topography.
9. Domestic Subjects.

TEXTILE INDUSTRIES.

Some details of this Department are given. The provisions in the other Departments are equally complete.

Worsted Spinning.—Weaving and Designing.

The course of instruction in Wool and Worsted Spinning and Weaving and Designing extends over 3 years.

The courses are designed to meet the requirements of those to whom a knowledge of the theory and practice of wool and worsted spinning and weaving and designing will be of practical utility, whether as designers, overlookers, managers, or merchants. The instruction is thus of special value to those intended for or engaged in:—

- (1) The spinning of yarns and the designing for, and manufacture of, woven fabrics.
- (2) The buying and selling of yarns and woven fabrics.
- (3) The manufacture or export of textile machinery.

The equipment consists of a whole range of worsted spinning machinery, appliances for yarn testing, hand and power looms, also diagrams and lantern slides for the satisfactory illustration of the courses of lectures.

Practical Spinning Course.

The practical course in spinning consists of exercises in adjusting, setting, timing and working the various machines, and in sampling, mixing, and testing the several varieties of wool, slivers, rovings, yarns, and twists, and also in making complete drawings of the machines and their parts.

Weaving and Designing.

Designing.—The principles of cloth construction, including the consideration of plain and twilled cloths; also modifications of plain cloths.

Sateens and the derivations of new weaves from the sateen.

Twills, etc., formed by the combination of two or more weaves; sateen, re-arrangement of twills, etc. The production of elongated and fancy twills.

Stripes and check designs, and drafting to weave on the lowest number of healds, and. pegging plan of the same.

Application of the principles demonstrated in the foregoing to dress fabrics, such as cashmeres, lustres, silks, etc., worsted and woollen trouserings, coatings, overcoatings, and mantle cloths.

Calculations.—The principles of counting yarns in worsted, woollen, cotton and silks. Finding the weight of warp and weft, and the cost of producing simple fabrics. The principle of counting the sett for local and other districts.

Loom.—The hand loom, its construction and various movements; elementary principles of power loom weaving.

Pattern Analysis.

Analysis of weave, including twills, ribs, sateens, corkscrews, stripes, checks, drafted patterns, and weave combinations.

Materials. Microscopic analysis of cloths, yarns, rovings, and fibres. Chemical tests. Testing for strength, elasticity, twist and evenness.

Various methods of ascertaining the weight per yard of cloths, and counts of warp and weft. Determination of warp and weft of the cloth.

Methods of finding sett and picks, also allowance for shrinkage.

Practical Weaving Course.

The practical course in weaving includes the following branches:—

Drawing-in and twisting. Cording-up and gaiting hand looms. Cording up and gaiting power looms. Tappet setting. Jacquard harness building. Card-cutting for dobbies and Jacquards. Lag pegging for dobbies. Setting and timing the various parts of power looms. Altering looms to weave different kinds of cloth. Weaving.

DAY CLASSES FOR UNIVERSITY EXAMINATIONS.

These classes cover Matriculation Examinations of London and the Northern Universities, and the Intermediate Examinations, Science and Engineering, of the University of London, also in Mathematics, Physics, Engineering subjects, Chemistry, English, French, German, Book-keeping House Painting and Decora-

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ting, Commercial Practice, Shorthand, Typewriting, Dressmaking, Millinery, Needlework, Cookery, Laundry Work, Art.

EVENING CLASSES AT THE COLLEGE.

These courses at the College are designed to give systematic training in the principles of Science and Art, as applied to the commerce and industry of Halifax and district, with especial reference to the following departments:—

(1) Commercial Knowledge. (2) Mechanical Engineering. (3) Electrical Engineering. (4) Building Trades. (5) Pure and Applied Chemistry. (6) Textile Industries. (7) Women's Work. (8) Art.

Courses have also been arranged for students desirous of obtaining Certificates of the Institutes of Bankers, Royal Institution of British Architects, Institute of Civil Engineers, the Bachelor of Science Degree, also the Bachelor of Science (Engineering) Degree of the University of London.

The real object of the student is to acquire a sound knowledge of principles and their direct application to his daily work. This can only be attained by a systematic training.

In the courses of study it is assumed that the student possesses a knowledge at least equivalent to the Fourth Form of the Council Secondary School. The Sub-Committee strongly advises those intending students who do not possess this preliminary knowledge to attend the Evening Continuation Schools.

With a view to aid in the systemization, which it is the great object of the College to encourage, the regular 5 or 6 year courses are suggested to young students.

In the Building Trades Department courses are held having an especial bearing on plumbing, house painting and decorating; while in the department of Textile Industries, courses are given in wool and worsted spinning, weaving, etc.

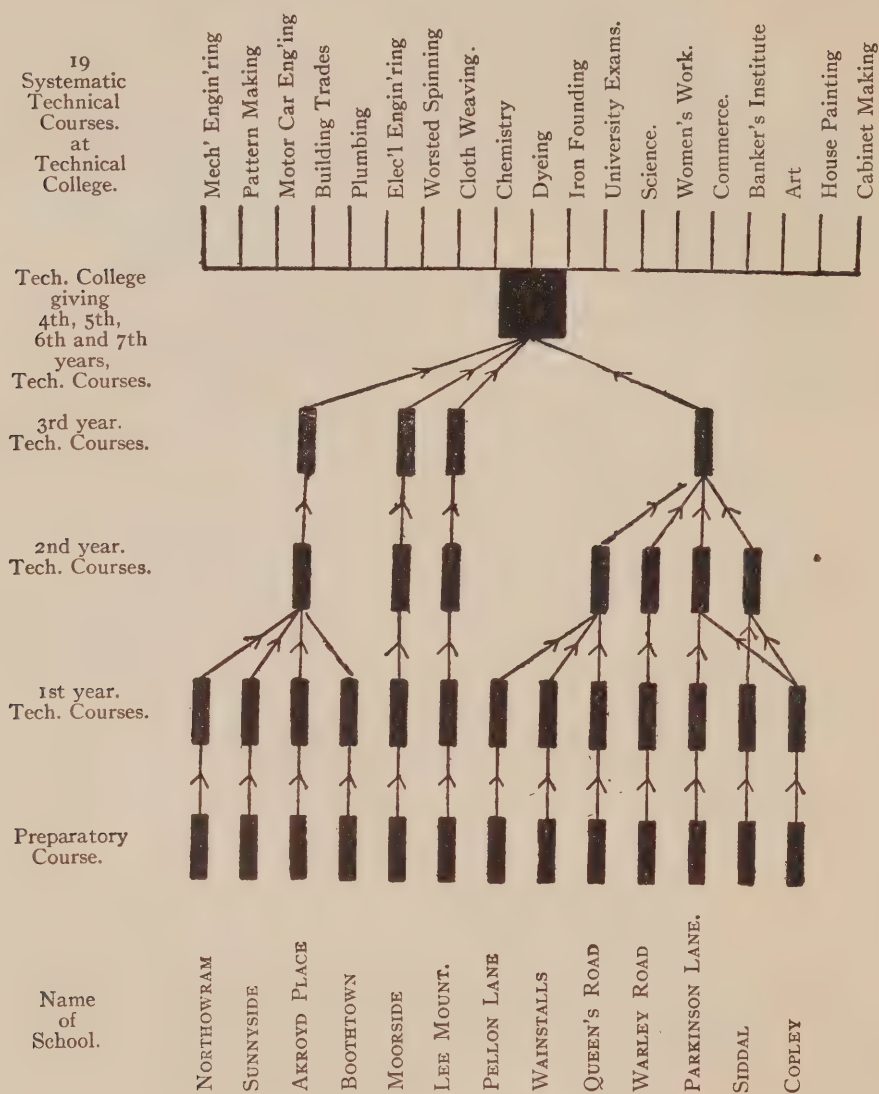
EVENING SCHOOLS, CO-ORDINATION.

The following diagram illustrates the Co-ordination Scheme. The heavy lines represent schools in which various courses are given (see details on left hand side). The thin lines show how the student passes from one course to another, either wholly in the same school, or partly in one school and partly in another of a higher grade.

Since preparatory courses are arranged in nearly all schools, a scholar who desires to take one of these courses will probably attend the school nearest to his home. After having passed successfully through the preparatory course, he will take one of the first year courses. If this be provided in the school he is already attending, he will continue his studies at that school, but if not, he will proceed to the nearest school of a higher grade indicated in the diagram; *e.g.*, a boy having satisfactorily attended the preparatory course and a first year course at Copley School will proceed to Siddal School for the second year course; similarly, a boy

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from Siddal School desirous of taking the third year course will proceed to Akroyd Place or Parkinson Lane School.



EVENING CONTINUATION SCHOOLS.

The object of these Schools is two-fold,—(1) To continue, by means of carefully graduated courses of instruction, the work of the day school; (2) To afford the necessary preparation to enable students to benefit by the instruction given in the the various departments of Technical College.

The Evening Schools are of four grades, providing, (1) Only a preparatory course; (2) Preparatory course and first year industrial and commercial

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courses; (3) Preparatory course and first and second year industrial and commercial courses; (4) Preparatory course, first, second and third year industrial and commercial courses and art courses.

CURRICULA OF EVENING CONTINUATION SCHOOLS.

COURSE.	SUBJECT.	WEEKLY HOURS.
Preparatory.	Calculations and Drawing	2½
	English	1½
	Workshop Practice	2
First Year Industrial	Practical Mathematics and Drawing	2½
	English	1½
	Workshop Practice or	2
	Practical Physics	2
Second Year Industrial	Practical Mathematics and Technical Drawing	3
	English	1
	Practical Mechanics and Physics	2
Third Year Industrial	Practical Mathematics	2
	Practical Mechanics and Physics	2
	Machine Drawing or Building Construction or Worsted Spinning or Cloth Weaving or Plumbing	2
First Year Commercial	English, Geography and History and Hand-writing	4
	Calculations	2
Second Year Commercial	Book-keeping and Commercial Arithmetic	3
	English	1
	Shorthand and Business Methods or	2
	French	2
Third Year Commercial	Book-keeping, Business Methods and Commercial Arithmetic	4
	Shorthand or French	2

WORKSHOP PRACTICE.

The workshop practice in the Preparatory and First Year Industrial Courses consists of either woodwork or metal work or lead work or wood-carving.

The workshop Courses extend over 3 or more years.

Woodworking.—The Course is intended for boys, who wish to acquire a practical training in the use of woodworking tools, including the construction of simple and useful models which the students have prepared to scale from sketches or from actual measurement. The students have the opportunity, under the supervision and direction of the instructor, of making any desired article, upon payment for materials, provided that the teacher is assured of their ability, and after a satisfactory working scale drawing has been prepared, either in the school or at home. Practical calculations are made by each student on the amount and cost of timber required for each model.

Short lectures are given on woodworking tools; their names, proper uses, correct handling, principles of construction, and the modes of hardening, sharpening and using them.

Also short lectures on timber; its nature, growth, description, qualities, seasoning, uses, etc.; countries and parts from which we receive our supplies, and the forms in which it is brought into the markets.

Leadworking.—The Course includes a series of graduated exercises on marking off and cutting out sheet lead, followed by simple exercises on lead bossing, and bending pipes up to 2-in. in diameter.

Metalworking.—Bench Work.—Use of hammer, chisel, and file in the preparation of flat and other surfaces. The making of keys and keyways for shafts and pulleys. Use of gauges and templates in fitting work. Use of the file and scraper in the preparation of true plane surfaces,

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viz., straight edges and surface plates. Use of the compasses, scribing block, square, &c., in marking out work preparatory to its being machined. The use of drifts in finishing square and other shaped holes. Use of taps and dies.

Turning.—Hand lathes. Use of the hand lathe. The different forms of tools required in working upon various metals.

Striking and chasing threads in the hand lathe. Chucking work in the hand lathe. Use of compound slide rests on these lathes. Use of boring tools.

There are Domestic Courses for girls under 16, running for 3 years, the compulsory subjects being English, Needlework and Domestic Science, or Drawing, or Singing; optional subjects, Dressmaking, Millinery, Cookery, Laundry work, Ambulance, Home Nursing and Housewifery.

SPECIAL CLASSES.

Special Classes are arranged for adults, *i.e.*, those of 18 and upwards, at any of the Evening Continuation Schools, provided a sufficient number of students offer themselves for enrolment. The following is a list of the Classes, with number of evenings per week:—*For Men*—Calculations, Reading and Composition, Geography and History, 2; Ambulance, 1. *For Women*—Calculations, Reading and Composition, and Needlework, 2; also 1 each for Making of Children's Clothes, Ambulance, Home Nursing, Cookery, Laundry Work, Dressmaking, Millinery.

DRAWING AND ART.

The object of this Course is to give, by a system of carefully considered exercises, a thoroughly practical knowledge of the rudiments of Drawing, so as to furnish a useful elementary training to those without previous knowledge of Art.

Those students who desire to make Art a part of their general education, or wish to adopt Art, either pure or applied, as a profession (*e.g.*, Designing), find this Course a most useful preliminary to the instruction given at the Technical College School of Art.

The subjects of instruction are English, Calculations, Freehand, Model, Geometrical Drawing, Light and Shade and Modelling.

SECTION 3: PREPARATORY TRADE SCHOOL.

OBJECT OF THE SCHOOL.

To provide a practical course of instruction and thorough preparatory training for boys from 12 to 15 who intend to be apprentices in any of the local trades.

The existing system of education, whilst amply providing for boys intended for commercial occupations, does not altogether meet the needs of those who may wish ultimately to be skilled artisans. In certain industries, owing to the changed conditions of production, the old apprenticeship system has completely

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disappeared, and it is now almost impossible for an apprentice to acquire an all-round knowledge of his trade, hence the necessity of widening the educational work to provide a training for those who are to be skilled workmen.

The narrowed training of apprentices may have very disastrous results; (a) to the apprentice himself, who, through the introduction of labour-saving machinery into his branch of the trade and his inability, through lack of an all-round training, to adapt himself to some other branch, may be forced into the unskilled labour market; (b) to the masters thorough the inadequate supply of well-trained foremen and works managers; (c) to the nation, which will be unable to maintain its position in the face of foreign competition unless its artisans are trained to the highest efficiency in industrial work.

The course arranged for this school, though in no sense claiming to teach a trade, is intended to meet, to some extent, the deficiency referred to above. It will give the apprentice a full knowledge of the elementary principles, scientific and artistic, of all departments of his work, and also a practical acquaintance with the tools and machines, etc., used in its various branches; thus the practical training of an Engineer's apprentice will include (a) the use of woodworking tools, exercises leading up to wood turning, and the making of simple patterns, (b) Metalworking, commencing with the use of the hammer, file and scraper, and later the shaper, planer, lathe, milling machine, etc.; also work at the fitter's bench. Laboratory practice will enable the pupils to determine, experimentally, the various scientific and mechanical principles which the apprentice will meet with in the workshop.

SUBJECTS AND COURSES OF INSTRUCTION.

Practical Mathematics, dealing mainly with workshop calculations.

Drawing, including sketching and dimensioning details from machines, buildings, furniture, etc., and making working drawings from the same.

Experimental Science, illustrating the principles of those sciences which bear directly or indirectly upon our trades and industries.

Workshop Practice, giving each pupil an acquaintance with the practical part of his trade and at the same time making him of immediate practical value to his employer.

The courses of instruction extend over 3 years, During the first year all pupils take the same course, in the second the drawing and workshop practice are specialized to some extent according to the intended trade of the pupils; and in the third this specialization is carried much further.

REQUIREMENTS FOR ADMISSION.

Applications are received from candidates not under the age of 12 years on September 1st. They are required to pass an entrance examination Fee, £3 per annum.

Parent or Guardian must undertake that scholar will attend regularly through the 3 years course. Each scholar must prepare class and laboratory notes and home work. Not more than 24 scholars were admitted in 1911.

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TIME TABLE (Hours per week.)

Subject.	1st Year	2nd Year	3rd Year (1st & 2nd terms.)	3rd Year (3rd term.)
Calculations.....	6	4	4	4
Drawing.....	6	5	4	6
English.....	6	4	4	.....
Exp. Science.....	4	7	6	4
Workshop Practice.....	8	10	12	16

CHAPTER X: THREE BOROUGHES IN LANCASHIRE.

A summary of the provisions made for technical instruction in three towns in Lancashire is given as illustrative of what is done in boroughs of relatively small population.

Barrow-in-Furness is a shipping and manufacturing centre with a population of 63,000. It has shipbuilding works, large docks, steel and iron works, engineering shops, foundries, etc.

Accrington lies 23 miles north of Manchester. Its principal industries are cotton spinning, weaving, calico printing, and the manufacture of textile machinery. There are coal mines and quarries in the neighbourhood. It has a population of 45,000.

Widnes is a town of 31,500 population situated 13 miles from Liverpool. It is a centre of manufacture for alkalis, etc.

SECTION 1: BARROW-IN-FURNESS.

The following information and suggestions were kindly furnished to the Commission by Mr. George Grace, Principal of the Municipal Technical School, after conference with the Staff of the School.

THE PROVISION AND TRAINING OF TEACHERS FOR TECHNICAL SCHOOLS.

The problem of providing the best kind of teacher for Technical Schools is not one which can be solved by one method alone. The subjects usually taken in these schools vary so much in their nature and in the kind of qualification necessary for their successful exposition, that it is advisable to consider the problem under at least two heads.

(a) Certain subjects, of which Mathematics is the most important, require clear thinking and thorough methods of teaching rather than extensive technical knowledge. Generally the best teachers are those who have been trained to the teaching profession, but whose tastes lead them to take an interest in the industrial applications of their subject.

The only assistance needed by these teachers is in the collection of the right type of example needed for technical purposes, and occasional assistance by some one with fuller technical knowledge.

(b) Other subjects such as Machine Drawing, Technical Electricity, Building Construction, etc., which deal mainly with technical knowledge, are best taught by men having considerable experience.

This is especially true of the advanced classes. Even here, however, it is necessary to recognize that successful instruction must be based on the scientific principles underlying the subject, and it is essential that the teacher should have a thorough grasp of these as well as of the empirical knowledge to be gained in the shop.

Very few of these men are likely to make successful teachers without some training in teaching method. Where possible they should spend some time working under an experienced teacher who should hear the lessons given by them and have authority to criticize or suggest improvements in method.

To take men straight from shop work and let them commence teaching without some training is likely in most cases to end in disaster.

At the same time it must be borne in mind that there are exceptional cases where men seem to have the ability to teach well without any such training.

Also, that more skilled teaching is necessary for elementary students than for those more advanced, and that a man with the requisite technical knowledge may make a good teacher for advanced classes who might be unsuitable for a class of beginners in the same subject.

THE INTRODUCTION OF MACHINERY INTO TECHNICAL SCHOOLS.

For such schools as the Barrow Technical School, where students are engaged in actual shop work during the day, it was unanimously agreed that there was no need for further school instruction in shop methods.

The function of the school should rather be instruction in the scientific principles underlying the industry in which the boys were engaged, and training in clear thinking, than in giving further practice in the manual part of their profession.

The head of our Engineering Department was head master in a "Trade School" in Ireland in which boys were taken immediately on leaving an ordinary Elementary School and given instruction in the underlying principles of their trades (Building Trades and Engineering), including instruction in working methods. He speaks highly of the result. It was found that the boys after passing through such a training were more useful when they entered their apprenticeship, and learnt their business more quickly. (The masters appreciated them enough to commence them with 10s. per week instead of 4s. or 5s.) He was also definite on the point that this kind of instruction did not mean "teaching them their trades in school," and that it needed supplementing by some kind of apprenticeship.

WHAT TECHNICAL SCHOOLS CAN DO TO ASSIST IN SOCIAL REFORM.

It is not felt that technical schools could deal directly with this problem. Students suitable for acceptance in a technical school are not likely under any circumstances to become abjectly poor. Indirectly, however, it was felt that a good technical school could render incalculable service in raising individuals of ability from even the poorest classes into positions where their talents could be of great service to the nation.

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For the bulk of the poorest classes, however, the question was one for schools of a different type, nearer the ordinary Continuation School than the Technical.

If attendance at these schools be made compulsory, and boys kept under strict discipline until 16 or 17, it would be a great service in preventing the growth of the unemployable class.

The aim of the schools, however, should rather be towards the improvement of general intelligence and keeping the boy under rigid discipline than to the imparting of technical instruction which would be of little service to him.

It was felt by the meeting that one of the causes of poverty and failure in life was the number of blind-alley occupations which do not train the boy for any position suitable for an adult, and which leave him too much to his own devices during the years from 12 to 16, when his habits are being formed, and when he needs very careful supervision and advice.

Several of the staff who have spent most of their lives as workmen, are of the opinion that much of the trouble in England is due to the impossibility of finding regular work for everybody under anything like pleasant conditions, and that no system of education can do anything to remedy this.

EVENING SCHOOLS.

The work of the Evening Schools in various parts of the town has been so arranged as to provide the preliminary instruction required by all Students before they attend the classes in the Science, Technological, or General Divisions of the Technical School.

In future it is intended to confine the instruction in the Technical School to more advanced work than is done in the other Schools, and the Committee strongly recommend young students to properly qualify themselves by attending an Evening School before joining the Technical School.

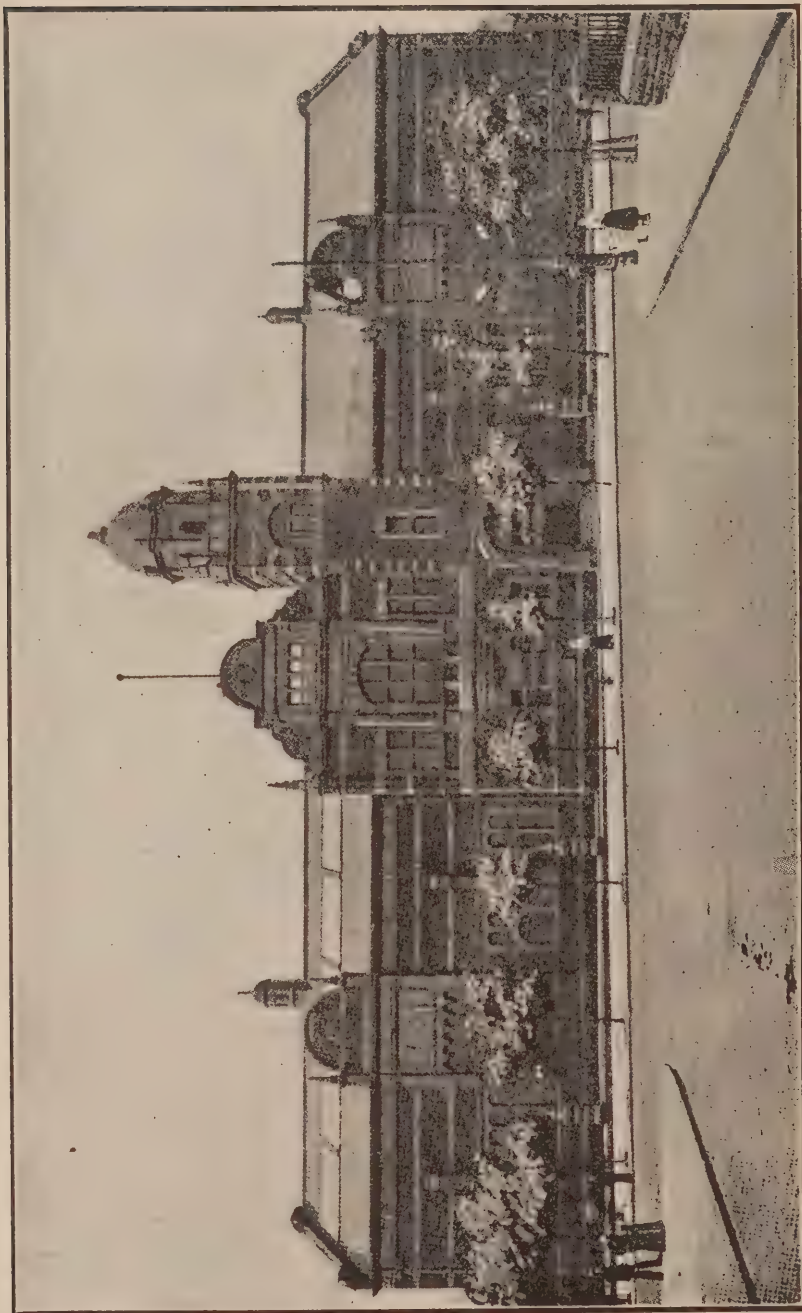
No pupil, attending a day school which receives grants from the Board of Education, will be admitted to any of the Evening Classes.

Fees must be paid in advance, and Students, who are admitted at a reduced fee, by joining a Course, will be expected, if they cease attending any of the Classes, to pay the amount of the reduction which has been allowed.

THE TECHNICAL SCHOOL.

The Curriculum comprises courses of instruction in Art, Science, Technology and General subjects, conducted under the Government Board of Education, the City and Guilds of London Institute, the Union of Lancashire and Cheshire Institutes, and the Royal Society of Arts.

The Classes are carried on mainly with a view to enable artisans—including apprentices, journeymen, foremen, draughtsmen and others—engaged in the principal industries of the town and district (shipbuilding, engineering, and the various building trades) to obtain such technical instruction in Science and Art as will prove useful to them in their respective trades or professions, and also conduce to their general intellectual improvement and advancement.



TECHNICAL SCHOOL: BARROW-IN-FURNESS.

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The instruction given also affords suitable preparation for candidates for National Art and Science and Whitworth Scholarships, Royal Exhibitions, etc., and several of the Classes meet the requirements of Teachers and others preparing for the London University Matriculation and other public Examinations.

As satisfactory progress depends upon the work done by the Student himself, special importance is laid on the amount and regularity of Home Work, and any Student who refuses to do Home Work may, at the discretion of the Principal, be dismissed from the School.

SECTIONS OF TECHNICAL INSTRUCTION.

The work of the Technical School is carried on in seven sections:—

Section I.—School of Arts and Crafts;

Section II.—Mechanical Engineering;

Section III.—Naval Construction;

Section IV.—Electrical Engineering;

Section V.—Building Trades Classes;

Section VI.—Chemistry and Metallurgy;

Section. VII.—General.

Each Section or Department is under a competent Head, with Assistants for the various divisions; *e.g.*, the Department of Mechanical Engineering has divisions for Machine Construction and Drawing, Practical Mathematics, Mechanics and Mechanical Engineering, Heat Engines, Practical Steam, and Metallurgical Chemistry.

There are courses for 5 years, and advanced classes beyond the fifth year.

An outline of the Mechanical Engineering Course is given for its own sake, and also because it is typical of the thoroughness and comprehensiveness of the work covered by the other departments of the school.

The classes are held in the evening from 7 to 9.30 o'clock.

MECHANICAL ENGINEERING COURSE.

The elementary stages of the subjects connected with Mechanical Engineering have been arranged in Group Courses, which indicate the order in which the subjects should be studied. These courses occupy three evenings per week.

A Group Course Certificate is awarded to Students who fulfil certain conditions. This Certificate is recognised by the Liverpool University as equivalent to part of their Engineering Course. Students holding it are allowed certain concessions if they afterwards attend the University.

In the Advanced Stages each Student is allowed to choose his own programme, but must submit it to the Principal for approval.

First and Second Year Courses.

Arrangements have been made to take these in the following Evening Schools in the town:—Secondary School, Vickerstown School.

Third Year Course.

No Student will be admitted to this Course who cannot show that he has a sufficient knowledge of the subjects taken in the first and Second Year Courses.

The following subjects must be taken:—

Practical Mathematics—Stage I.

Mechanics and Practical Mechanics—Stage I.

Machine Drawing—Stage I.

The following is an outline of the *Syllabi of Subjects*:

PRACTICAL MATHEMATICS.

Stage I.

Arithmetic.—Revision of contracted methods, rough checks and the application of geometrical methods of calculation.

The use of logarithms.

Mensuration.—Areas of rectilinear figures and circles. Parts of circles and irregular figures such as indicator diagrams.

Surfaces of cones, cylinders, etc.

Volumes of regular solid forms, and the applications of mensuration to practical problems.

Algebra.—Elementary algebra to simultaneous equations with practice in manipulation of formulæ, such as found in engineering pocket books.

Trigonometry.—The meaning and use of the trigonometric functions. Solution of simple triangles.

Squared Paper.—The use of squared paper to solve problems where quantities are connected with one another according to simple laws.

Interpolation. Curves of percentages, etc.

Text-Book.—Saxilby's "Introduction to Practical Mathematics," 2/6.

MACHINE DRAWING.

Stage I.

The construction, proportions, etc., of simple machine parts, such as riveted joints, bolts, nuts and screws. Simple couplings for shafts, pistons, etc.

The geometrical constructions used in mechanical drawing and the accurate use of instruments.

The preparation of working drawings and tracings, according to ordinary drawing office methods, the examples being chosen with the view of gradually developing the student's knowledge of projection.

Each student will be expected to provide himself with a Sketch Book in which to enter sketches and notes. He will also be expected to make dimensioned sketches from actual parts of machines and models, and from these sketches to prepare complete drawings to scale.

NOTE.—Students should consult the Teacher before purchasing Drawing Boards or Instruments for this Class.

TEXT BOOK.—Machine Drawing by T. & T. G. Jones, Book I., 3s.

APPLIED MECHANICS.

Problems in simple statics.

Centre of gravity. The lever. Principle of work.

Simple machines and the applications of the principle of work and principle of moments.

Mechanical advantage and efficiency.

The laws of dry friction on horizontal and inclined planes.

Simple cases of tension and compression. Hooke's law. Elastic limit, etc.

The use of measuring instruments, micrometers, and other gauges.

Common engineering materials, their properties, common uses, etc.

TEXT BOOK.—Duncan's Applied Mechanics for Beginners, 2s. 6d.

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PRACTICAL MECHANICS.

Stage I.

A Special Laboratory has been fitted up for experimental work in Mechanics, so that each Student shall be able to perform simple quantitative experiments and demonstrate the elementary principles of Mechanics, such as:—

Resultant of a number of forces acting at a point.

Conditions of equilibrium on an inclined plane.

The laws of the lever.

The laws of dry friction.

The effects of tension, compression, torsion and bending, Strength of wires of different material.

The relation between the work put in and that given out in screw jacks, cranes, pulleys, etc.

NOTE.—Students attending this Class must keep proper Laboratory Note Books, and submit these periodically to the teacher for correction.

This requirement is not optional on the part of Students, but an essential condition of entrance to and continuation in the class.

Fourth Year Course.

Students may be admitted to any of the subjects in this course if they can shew a satisfactory knowledge of the work taken in the corresponding subjects of the Third Year Classes.

The following subjects must be taken:—

Practical Mathematics, Intermediate Stage.

Mechanics and Practical Mechanics, Intermediate Stage.

Machine Drawing, Intermediate Stage.

Any Fourth Year Student who is not sufficiently advanced may take a Stage I Class in any subject instead of the above.

PRACTICAL MATHEMATICS.

Intermediate Stage.

Practice in the use of logarithms, especially in difficult cases of negative and fractional indices.

More difficult problems in mensuration.

Determination of volumes of irregular solids by method of sections.

Algebra to quadratic equations. Partial fractions.

Practice in the use of trigonometrical formulæ, and simple cases of the solution of triangles.

Measurement of angles in radians. Measurement of angular velocity.

Use of accurate drawing in the solution of problems, especially when measured drawings can replace complicated calculation.

The use of squared paper for more difficult curves.

Full investigation of straight lines and simple cases of maxima and minima. Laws of form ax^3 . $a+bx^2$, $a+bx+cx^2$, etc.

Determination of mean values, areas, etc.

TEXT BOOK.—Saxilby's Practical Mathematics, 6/6.

MACHINE DRAWING.

Intermediate Stage.

In this class more difficult work in Machine Drawing will be attempted, including more difficult Geometrical Constructions used by draughtsmen, such as:—

Double curves. The projection of curves in three dimensions, such as on the headstock of a lathe. Projection of a screw on a cylinder.

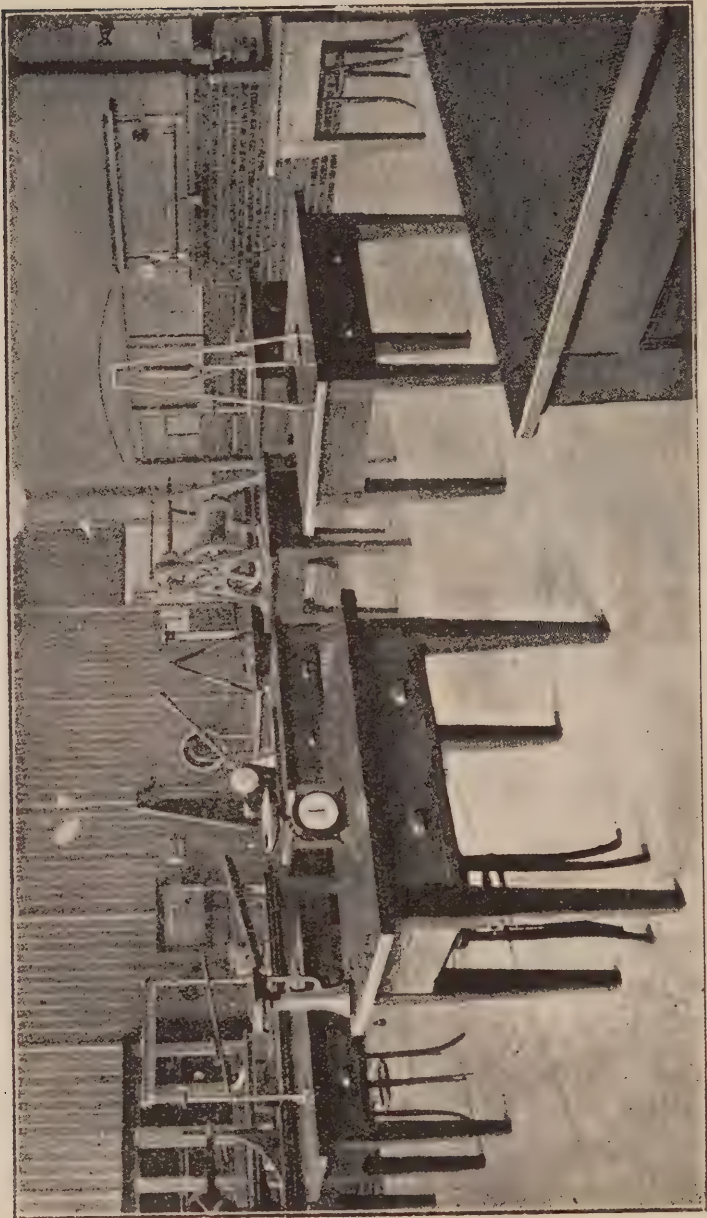
Also lessons will be given on the construction and proportion of more complicated machine parts, such as:—

Bearings and pedestals, couplings and clutches; the teeth of wheels, Bevel wheels; the construction of crossheads, eccentrics, pistons etc.

Students will be expected to provide themselves with accurate drawing instruments and note books, and to submit their drawings and sketches periodically for the inspection of the teacher.

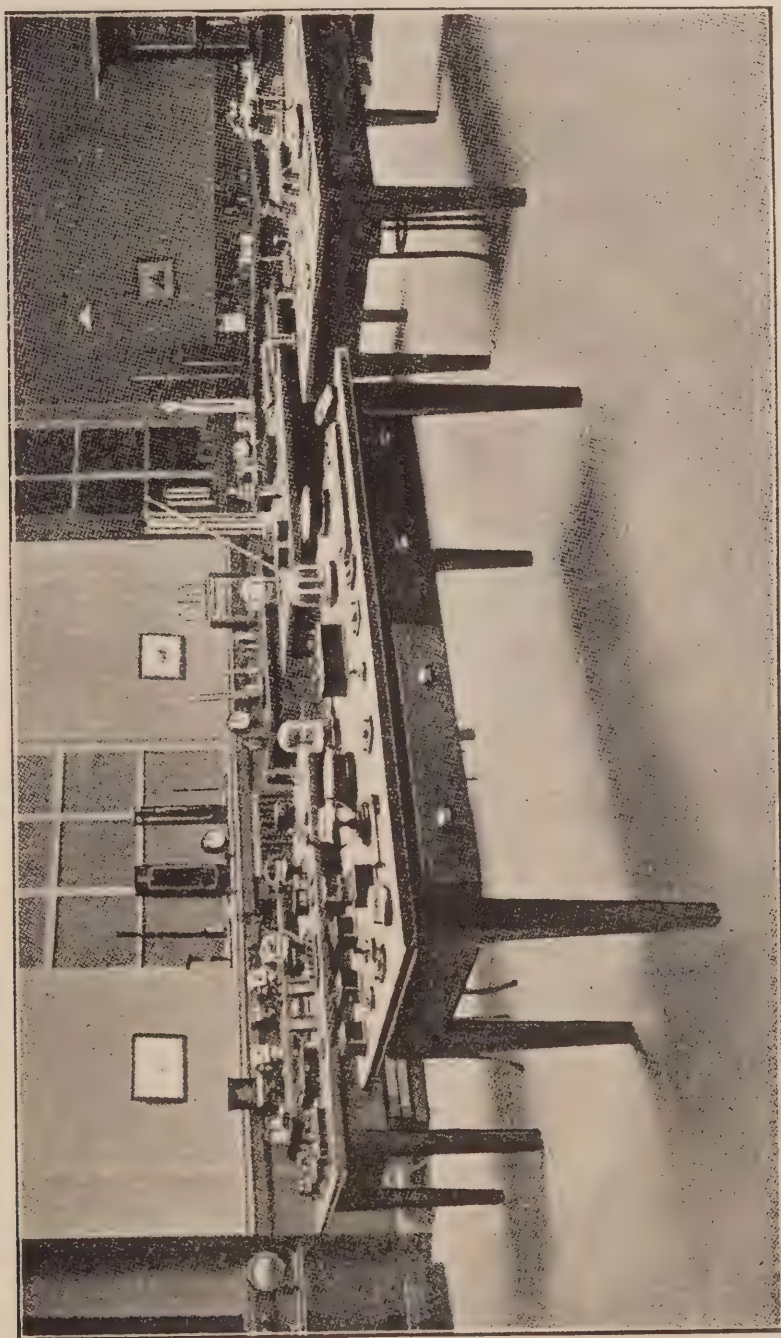
The Prizes in these classes will be given for the best set of work done during the session.

TEXT BOOK.—Machine Drawing by T. & T. G. Jones. Book I., 3s.



TECHNICAL SCHOOL: MECHANICS LABORATORY.

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TECHNICAL SCHOOL: ELEMENTARY ELECTRICAL LABORATORY.

MECHANICS.

Intermediate Stage.

Revision of Third Year's Work.

Statics of four and more forces acting at a point. Funicular polygon and its application.
 More difficult cases of parallel forces.
 Fuller investigation of friction between dry and lubricated surfaces.
 The transmission of power.
 The study of mechanisms such as toggle joints, quick return motions, epicyclic trains, etc.
 Elementary cases of tension, compression and torsion, etc.
 The properties of the chief materials used in engineering.
 Hardening, tempering, annealing, etc.
 Elements of Dynamics, Potential and Kinetic Energy, Energy Rotating Fly Wheel.

PRACTICAL MECHANICS.

Intermediate Stage.

Continuation of Third Year's Course, with more difficult experiments in Statics, Friction, Tension, Torsion, Bending, etc.
 Experiments with inclined planes, epicyclic trains, toothed gearing, etc.
 Experiments in Dynamics.
 Hydraulics: Discharge from orifices, over weirs, down pipes, etc., effect of bends.
 Hydraulic jack.

Fifth Year Course.

Students may be admitted to any of the classes in this course if they can show a satisfactory knowledge of the work taken in the previous courses.

The following subjects must be taken:—

Practical Mathematics—Stage II.

Machine Drawing—Stage II.

Heat Engines and Practical—Stage I.

Any Fifth Year Student who is not sufficiently advanced may take an Intermediate Stage Class in Mathematics or Machine Drawing.

PRACTICAL MATHEMATICS.

Stage II.

Further practice in the use of logarithms and other mathematical tables.
 Evolution from more difficult formulæ.
 The trigonometrical ratios of one angle, including the solution of right angled triangles.
 Use of squared paper for investigation of $y = ax^n$, $y = ac^{bx}$, etc.
 Graphic solution of equations. Determination of laws from experimental data. Substitution of linear for more complex laws.
 More difficult mensuration.
 Rate of increase. Simple differentiation. Maximum and minimum values. Easy integration.

TEXT BOOK.—A Course in Practical Mathematics. F. M. Saxilby. Longman's, 6/6.

MACHINE DRAWING.

Stage II.

In this class Students attempt a series of drawings illustrating the construction in detail of some fairly complicated piece of machinery, such as a small marine engine or locomotive.

The drawings made are finished and fully dimensioned as if for shop purposes. Each Student has the opportunity of learning not only the preparation of drawings in pencil, but of making finished tracings suitable for reproduction.

A prize is offered by the Committee for the best set of drawings done in this class.

By the kindness of Messrs. Vickers, an Air Compressor has been erected in the School, which Students have the opportunity of measuring and drawing.

TEXT BOOK.—Low and Bevis's Machine Design.

SESSIONAL PAPER No. 191d

HEAT ENGINES.

Stage I.

The fundamental principles of physics on which a scientific knowledge of steam and other engines must depend.

Thermometry. Calorimetry. Capacity for Heat. Specific heat. Latent heat. Total heat of evaporation, etc.

Fuel and the heat of combustion of fuel.

The properties of steam. Boyle's law. Use of steam tables, etc.

General description of steam engines and the details of their construction, *e.g.*, cylinders, pistons, crossheads, cranks, eccentrics, etc.

The action of the slide valve, and the effect of lap, lead, etc.

The indicator and meaning of the diagrams taken by it.

Boilers, their construction and simple calculations about them. Common fittings.

This course will be illustrated by specially prepared diagrams and lantern slides taken from modern engines.

TEXT BOOK.—Duncan's Steam and other Engines. 5s.

PRACTICAL STEAM AND HEAT ENGINES.

In this Course Students perform for themselves the experiments described in the Theoretical Lessons, including:—

Simple experiments in Thermometry and Calorimetry.

Determination of Boyle's Law. Relation between temperature and pressure for steam, etc.

Determination of calorific value of fuels.

Investigation of Indicator Diagrams, including use of planimeters.

Study of motion of parts of an engine, including the effect of altering the lap and lead of a slide valve, reversing gears, expansion valves, etc., by means of moving models.

A small portable engine and boiler and a petrol motor have been arranged in the basement for experimental purposes, and will be used for determining B.H.P., I.H.P., coal and petrol consumption, etc.

TEXT BOOK.—Duncan's Steam and other Engines. 5s.

ADVANCED CLASSES IN MECHANICAL ENGINEERING.

These Classes cover most of the work required for the Stage III. Examination of the Board of Education, the Honours Examinations of the City and Guilds Institute in Mechanical Engineering, the London B.Sc. (Engineering) and the Institute of Civil Engineers' Examination.

Students who have passed through the work of the Third, Fourth, and Fifth Year Courses satisfactorily are allowed to choose a programme to suit their particular circumstances.

PRACTICAL MATHEMATICS.

Stage III.

No student is admitted to this class who does not shew a sufficient knowledge of the work done in Stage II.

Syllabus.

The use of approximate formulæ and their derivation.

Partial Fractions. Imaginary and Complex Quantities.

Knowledge of limits in such cases as $\frac{\sin x}{x}$

Determination of values of $\sin x$, $\cos x$, e^x , and $\log x$, using series.

More advanced Trigonometry, including the addition formulæ and the solution of triangles.

Theorems relating to areas and volumes of solids and surfaces of revolution.

Graphic methods of finding centre of gravity and moments of inertia.

Plotting of functions $y = a \sin (cx+d)$, etc.

Harmonic motion, Fourier's Series. Harmonic analysis. Vector Algebra. Scalar and Vector products.

Further work in differentiation and integration.

Simple differential equations.

Problems in differential and integral calculus and their application to Engineering.

TEXT BOOK.—A Course in Practical Mathematics, F. M. Saxilby (Longman's), 6/6.

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MECHANICS AND MECHANICAL ENGINEERING.

Stage II.

This subject is divided into two sections, viz.: "Strength of Materials" and "Machines and Hydraulics."

Students may take either section, or both, during the same session.

Graphic Statics—

Including the determination of centres of gravity and moments of inertia by graphic methods.

Strength of Materials—

Tension, Torsion, Compression, Bending, and Shearing considered in detail. Application of principles to the design of riveted joints, beams and girders, etc.

Strength of thin shells and of thick cylinders as used for hydraulic presses.

Behaviour of materials when tested. Fatigue, elasticity and elastic limits. Deflection of beams.

Reinforced concrete. Struts and pillars. Arches. Strength and stiffness of springs.

Students are recommended to take the Advanced Laboratory Course in connection with this class.

Machines—

Problems on velocity, acceleration and force.

Mechanisms, Belts, Ropes, Chains, Links, Wheel Trains, etc.

Friction of Screws, Rollers and Belts.

Dynamics of rotating bodies and application to fly wheels, governors, and the balancing of engines.

Effect of a blow, reciprocating motion and vibration.

Harmonic motion and torsional rigidity.

Hydraulics—

Flow of water over notches and in channels.

Effects of friction in pipes, etc.

Hydraulic machinery, lifts, presses, pumps, turbines, jacks, etc.

TEXT BOOK.—D. A. Low's Applied Mechanics (Longman's), 7/6.

Students are recommended to take the Advanced Engineering Laboratory Course in connection with this class.

MECHANICS AND MECHANICAL ENGINEERING.

*Stage III.**Graphic Statics—*

Resultant of forces not in one plane. Force diagrams for roof trusses and built-up girders.

Strength of Materials—

Testing of materials, influence of shape of test pieces. Impact and other tests.

Beams and Girders—

Relation between bending movement, curvature, slope and deflection. Continuous girders. Riveted joints.

Struts—

The Euler, Rankin and Gordon formulæ. Eccentric loading.

Retaining Walls—

Reinforced concrete beams and struts. Masonry and metal arches.

ENGINEERING LABORATORY.

The Engineering Laboratory, which is well equipped for experimental work in Mechanics and Engine Testing, is open on Monday, Wednesday and Friday mornings from 9 to 12 and Wednesday, Thursday and Friday evening from 7 to 9.30. The work done may be selected from the following:—

Testing of materials in tension, compression, torsion, shear and bending.

Deflection of beams fixed at the ends. Continuous beams.

Determination of B.H.P., I.H.P., water and fuel consumption, etc., of steam and petrol engines.

Calorific value of solid and liquid fuels.

Dryness, fraction and quality of steam.

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Balancing of rotating masses and other dynamical experiments.

Flow of water over weirs and through orifices.

Friction of water in pipes, etc.

No student is admitted to this course who does not show sufficient theoretical knowledge of the subject to benefit by the experiments.

HEAT ENGINES.

Stage II.

Students in these classes should have done, or be doing, Practical Mathematics at least equal to the level taken in the Stage II Class of that subject.

Properties of Steam and Gases—

The application of thermo-dynamics to Heat Engines. Calculation of mean effective pressure in Single, Compound, Triple and Quadruple Expansion Engines.

Determination of dimensions for cylinders. Limits of useful expansion. Cylinder condensation.

Engine Mechanism—Slide valve diagrams. Effect of lap, lead, advance, etc., link motions. Radial gears.

Governors and fly wheels. Variation of effort on crank. The balancing of simple engines.

Design—Types of steam engines and Internal Combustion Engines. Arrangement and construction of details.

Construction and action of turbines.

Types of boilers, their construction and details of fittings.

Combustion and calorific value of fuels.

The course is illustrated by lantern slides of modern engines, details, etc.

Stage III.

The Properties of Steam and Gases in general—Including more advanced examination of engine cycles. The behaviour of steam in the cylinder and gases in internal combustion engine.

Entropy and entropy diagrams.

Engine Mechanisms—Valve motions, problems on valve and valve gear design. The balancing of engines. Curve of crank effort. Acceleration and inertia effects. Governor problems. Balancing by arrangement of cylinders.

Indicators and indicator diagrams. Compound engine diagrams and their relation.

Engine and boiler testing. Balance sheet for engines.

Design—High speed engines. Corliss and trip gears. Locomotives. Turbines. Gas, Oil engines and Producers.

Lancashire, vertical, tubular, marine and other boilers. Boiler fittings.

This course is illustrated by a specially prepared set of lantern slides.

MACHINE CONSTRUCTION AND DRAWING.

Stage III.

The course of study arranged in this stage comprises a series of examples of the application of the ordinary formulæ in use for the proportioning of machine details—strength and proportion of riveted structures—shafting under torsional and bending stresses—belting and other methods of transferring energy.

Graphic methods of dealing with the mechanism of the steam engine. The design of cycloidal and involute teeth. Physical properties of materials. Special mechanism adopted in the construction of machine tools—cams—quick returns in cutting tools, etc.

Students are assumed to be conversant with the geometrical problems involved in machine drawing, as in this stage more than ordinary knowledge of projection is insisted on.

METALLURGICAL CHEMISTRY.

This class has been arranged specially to supply advanced Engineering Students with some knowledge of those parts of Chemistry and Metallurgy which are of most importance in Engineering.

Each evening's work consists of one hour's lecture, and one and a half hours in the Laboratory.

Chemistry—Objects of Chemistry. Chemical action. Elements. Compounds. Symbols, Formulæ. Equations, etc.

The laws of chemical combination.

Commonly occurring elements, especially those used in engineering, such as carbon, sulphur, phosphorus and silicon; their chief properties and uses.

Acids, Gases, Salts, etc., used in engineering chemistry.

Air and Combustion, rusting and oxidation in general, and means of prevention.

Metallurgy—The scope of Metallurgy, physical properties of metals. Metallurgical terms and processes.

Furnace types. Refractory materials.

Fuel—Calorific power and intensity: Wood, coal, coke, oil, gaseous flues, etc.

Producers and producer gas, etc. Regenerative systems.

Blast furnace waste gases, their cleaning, composition and general uses.

Coke Ovens and their bye-products.

Pyrometry.

Water—Its composition, usual impurities, hardness, scale in boilers. Softening processes and their objects. Causes of pitting and erosion in boilers.

Iron—The ores of iron. Preparation of ores and extraction of the metal. The Blast furnace, its structure and working. Composition and grading of pig irons. Influence of impurities, i.e., carbon, silicon, manganese, sulphur, phosphorous, etc. Cast and malleable iron. Wrought iron, its preparation, uses and properties.

Steel—Definitions and classification of steel. Ordinary processes for making steel. Composition and mechanical properties of typical varieties. Hardening, tempering, annealing, etc.

Non-ferrous Metals used in the Foundry—Copper, zinc, lead, tin, antimony, nickel, cobalt, aluminum, manganese, etc. Their ores, extraction, properties and uses.

Common Alloys—Composition of brasses, bronzes, gunmetal, bearing metals, etc. Their relation between composition and properties.

SECTION 2: ACCRINGTON.

THE EVENING CONTINUATION CLASSES.

The Education Committee of the Borough have established Evening Classes at six centres in the Day School buildings. The courses are for two years. There are also preparatory courses for those who are not qualified to go on with the Technical, Commercial, or Domestic Courses.

The classes are held from 7 to 9 in the evenings three times a week.

Those who have taken these evening classes are prepared to go on to the classes at the Municipal Technical School.

MUNICIPAL TECHNICAL SCHOOL.

The objects of the School are to give, by carefully arranged courses of Study, a thoroughly practical knowledge of Drawing, Painting, Design, and Modelling, especially in their application to the professions and trades of the district, so as to furnish useful training to those who intend to work as Architects, Designers, and Craftsmen.

In addition to this, it is the object of the School to assist those who desire to make Art a part of their general education; and also to give facilities to those wishing to follow Art as a profession, or to include it in their general qualifications as Teachers in Primary, Secondary, or Art Schools.

SUBJECTS OF ART INSTRUCTION.

ELEMENTARY.

Freehand, Model, Geometry, Perspective, Light and Shade, Design, and Modelling.

Industrial Art Course, in connection with the Examination Scheme of the Lancashire and Cheshire Institutes.

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ADVANCED.

Design.—Textiles, Wall-papers, Stencils, Furniture, Lithography, Metal Work, Wood-carving, Plaster Work, Gesso, Embroidery, Printed Cottons, etc.

Life Class.—Drawing, Painting, Figure Composition.

Modelling.—Ornament, Figure, Designing in Relief.

Architecture.—Design, Decoration, History and Development, Building Construction.

Painting.—Interiors, Flowers, Still Life.

Textile Design Class.—A special course of instruction is arranged for students attending the Weaving Classes.

Painting and Decorating.—Special Class for drawing examples of Historic Ornament. Setting out walls and ceilings. Designing for stencils.

Advanced students take Decorative Painting with the pencil as distinct from Stencilling.

Craft Work.—Pottery, Tiles, Metal Work, Mosaic, Gesso Work, Embroidery, Weaving, Practical Painting, Decorating and Sign-writing, Jeweller's Work.

Systematic Courses.—Extending over 4 or 5 years are given in Applied Art, Architecture. Painting and Decorating, Sculpture, Plastering, Cabinet making, Photography.

SCIENCE AND TECHNICAL COURSES.

These are given during five years in the evenings in the following subjects:—

Applied Mechanics, Building Construction, Cotton Spinning, Cotton Weaving, Coal Mining and Surveying, English, Experimental Physics and Mechanics, Heat Engines, Human Physiology, Hygiene, Inorganic Chemistry, Machine Construction, Magnetism and Electricity, Organic Chemistry, Plane and Solid Geometry, Practical Drawing, Practical Mathematics, Practical Mechanics, Plumbing, Pure Mathematics.

Four or five year courses are given in: Mechanical Engineering, Electrical Engineering, Chemical Industries, Building Trades, Plumbing Trades, Textile Trades (Cotton Spinning and Weaving), Coal Mining.

There are also courses in Domestic subjects, Commercial subjects and Natural Sciences.

SECTION 3: WIDNES.

The educational scheme for the borough includes Evening Continuation Classes and courses at the Municipal Technical School. The Education Committee makes the following statements in its announcement:

In order to gain any sound knowledge of a Technological subject, or of any special branch of Science, it is necessary that other allied subjects be also studied.

In all cases a preliminary knowledge of Elementary Mathematics, Geometry, General Science, and English is essential before attempting any one of the special branches. Past experience has shewn that a disregard of this preliminary knowledge has been the cause of much disappointment to both teacher and pupil; consequently, in order that all pupils attending these classes may have the opportunity of obtaining the maximum benefit in the limited time available, the scheme of work at the Technical School and Continuation Schools has been carefully co-ordinated and systematised.

Furthermore, Courses of Study, extending over 3, 4 or 5 years, and bearing upon the trades and industries of the Borough, have been organised. Students will be required to take the Course most suitable to their trade or profession, and to their standard of previous attainment; and also to take three classes where provided in the selected course. Only in very exceptional cases will they be allowed to take individual subjects, by permission of the Principal. As a general rule, students will be expected to have passed through the Evening Continuation School before entering the Technical School, or to show evidence of a standard of instruction equivalent to that of the Preliminary Technical Certificate of the Union of Lancashire and Cheshire Institutes.

Students who have passed the examination at the end of the First Year's Course may proceed to the Second Year's Course in the department which they select. Teachers hold an entrance examination in their respective classes at the commencement of the Session, and students obviously unfitted to benefit by the classes they have chosen are transferred to a more suitable Course.

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Facilities are given, in most of the Courses, for practical work, but attendance at the corresponding Theoretical Classes is compulsory.

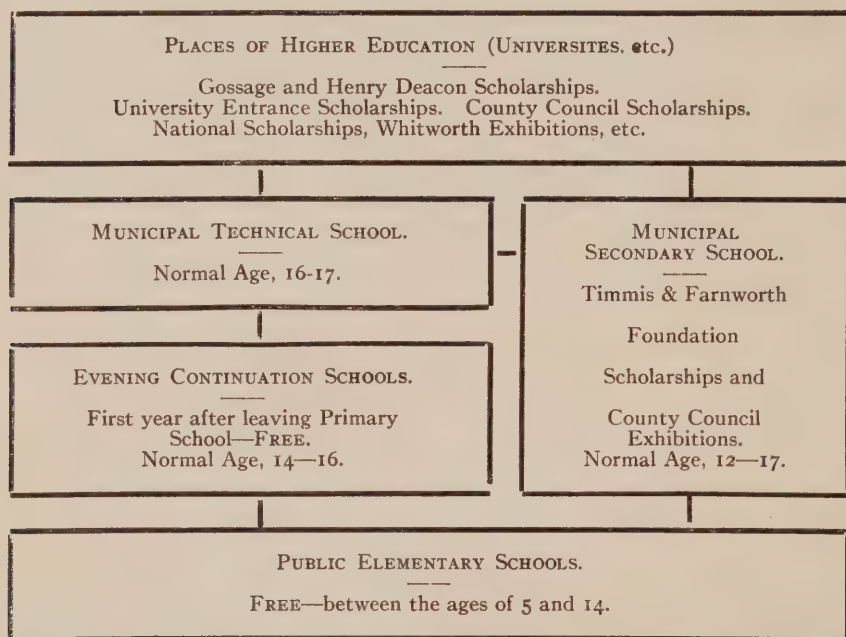
Miscellaneous Classes have been established in Ambulance (Men and Women), Cookery, Dressmaking, Elocution and Voice Production, English, Esperanto, French, Horticulture, Pure Mathematics, Millinery, Needlework, Principles of Teaching, Physiology, Singing (Elementary and Advanced), Theory of Music, Welsh, to meet the needs of adult Students who desire to take up the study of some subject of a recreative character, or to extend their general knowledge. Students of full age, who do not hold Works Vouchers, may attend one or more of these Classes at their option.

While no Classes have been specially arranged to suit Civil Service Examinations, it will be found that many of the Classes will form a very suitable preparation for the same. The Principal will be happy to give any advice to any students desiring to enter the Civil Service.

The following diagram illustrates the provision made in Widnes for free and assisted Education at Day Schools and Evening Schools up to the age of 19.

The facilities offered make it possible for a boy or girl leaving the Elementary School at 13 to proceed to the Secondary School and thence to the University at the age of 18 or 19.

Those unable to attend the Secondary School may, after passing two years in the Evening Continuation Schools, proceed to the Technical School for 4 years and thence to the University, Manchester School of Technology, Royal College of Science, or other place of Higher Technical Education.



When a subject is taught in two or more stages, students are require to have worked successfully through the lower stage before entering a class in a higher stage of the same subject.

As a general rule, *industrial students* will be required to take a course of subjects, and attend 3 evenings per week, and will not be allowed to join for one subject only.

MUNICIPAL TECHNICAL SCHOOL.

I.—COMMERCIAL COURSE.

Accountancy and Banking, Arithmetic, Commercial Book-keeping, Commercial Correspondence, Commercial Law, Economics, English (Commercial), French, Geography, Shorthand, Typewriting,

II.—CHEMICAL INDUSTRIES COURSE.

Alkali Manufacture, Chemistry, Physics, Practical Mathematics, Metallurgy, Laboratory Curator.

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III.—MECHANICAL ENGINEERING COURSE.

Applied Mechanics, Geometry and Hand-sketching, Heat Engines, Machine Construction, Practical Mathematics, Magnetism and Electricity.

IV.—METAL PLATE COURSE.

Geometry, Metal Plate Work.

V.—FOR ARCHITECTS, BUILDERS, CARPENTERS AND JOINERS.

Building Construction, Carpentry and Joinery, Practical Geometry, Practical Mathematics, Staircasing and Handrailing, Builders' Quantities, Graphic Statics, Land Surveying.

VI.—FOR BRICKLAYERS AND MASONS.

Brickwork and Masonry, Building Construction.

VII.—FOR PAINTERS AND DECORATORS.

Painting and Decorating, Drawing and Design.

VIII.—ART CLASSES.

Antique, Freehand, Geometrical, Light and Shade, Model and Perspective Drawing, Plant Form and Design.

MISCELLANEOUS CLASSES.

Ambulance, Cookery, Dressmaking, Elocution, English, Esperanto, French, Horticulture, Mathematics (pure), Millinery, Needlework (Art), Principles of Teaching, Physiology, Singing, Theory of Music, Welsh.

EMPLOYMENT REGISTER.

The Committee do not undertake to find employment for students, but many firms make enquiries at the School when in need of employees. Students desiring employment or advancement should therefore see the Principal and leave with him particulars of their qualifications, etc. He will then be pleased to inform them of any suitable vacancy which may come to his knowledge.

PRIZES AND REWARDS FOR STUDENTS.

As it is desirable that prizes shall take the form most beneficial to the students, those who obtain them have the option of choosing books on Scientific, Art, Technological, or other subjects approved by the Principal, or a part or whole of the net value may be taken in instruments or tools, which will be directly useful to the winners in their subsequent studies.

CHAPTER XI: DRAWING, DESIGN AND ART.

SECTION 1: ROYAL COLLEGE OF ART, SOUTH KENSINGTON, LONDON.

This institution, founded in 1837 with the definite purpose of encouraging the study of art in relation to industry and manufactures, is primarily intended for the Training of Art Masters and Mistresses for the United Kingdom and for the instruction of students selected by competition in the Art examinations of the Board of Education. Other students are admitted when there is room for them on payment of fees. There is no age limit for students. Candidates upon admission are placed in the upper or lower division of the school according to their proficiency.

Students go under two categories: (a) those who are passing through the course of teacher-training with a view to obtaining the "Full Associateship," and (b) those who are specializing in one or the other of the four schools of the college with a view to obtaining a "Schools Associateship."

These four "schools," or departments are as follows:— (1) Architecture; (2) Ornament and Design; (3) Decorative Painting; (4) Sculpture and Modelling. The instruction is so arranged that the students may pass through the courses in all these four schools or any one or more of them. There are also "craft classes" for students of design.

Each student on entering the College takes a preliminary course in Architecture, unless already qualified in that subject, with a view to impressing upon him the unity of the arts in their decorative aspect. The rest of the period of study follows one or more alternative courses. Students intending to become teachers take a full course covering the work of all four schools; and students such as National Scholars, for whom a shorter and more specialized course is suitable, spend the whole of their time, after the introductory term, in one department.

FULL ASSOCIATESHIP.

This entitles to the use of the initials "A.R.C.A (London)" and is granted to students who have studied in the College for at least six terms, spending at least one term in each "School" and not less than four terms in the upper division of one or more schools of the college; or who have obtained a first-class certificate in the upper division of one of the schools and a first-class in the lower work, or a second class in the upper division of each of the four schools, or who have executed a composition for a given decorative subject to the satisfaction of the "official visitors."

Candidates for Full Associateship (other than holders of Royal Exhibitions, National Scholarships, Free Studentships, and Special Studentships, who are

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admitted without being required to submit works or pass entrance tests) must submit a folio of drawings in architecture, sculpture, painting and ornamental design, the latter including a sheet of letters in good Roman capitals. If these drawings are accepted, candidates must pass test examinations in three out of four subjects: (a) Architectural drawing—a small object selected from the museum, 12 hours allowed; (b) Sculpture—a model in clay of the mouth of Michael Angelo's "David," 6 hours; (c) Painting—drawing in charcoal—from life, of the head, hand and foot, light and shade being indicated, 9 hours; (d) Ornament and design—drawing from memory of piece of foliage such as oak, ash or lime.

SCHOOLS ASSOCIATESHIP.

This is granted to students who spend four terms in the College, one being in the School of Architecture and at least three terms in the upper division of the school in which the student specializes; or who obtain a certificate in Architecture and the school certificate in the upper division of the school in which they specialize; or who have executed a composition for a given decorative subject to the satisfaction of the visitors.

Candidates for Schools Fellowships must submit works as follows:—(a) For the School of Architecture:—a measured study in pencil of an ancient building to scale: also mouldings full size; also some ornament with the perspective sketch of the same. (b) For the School of Ornament and Design:—six drawings from nature or architecture, of which two must be careful pencil drawings of flowers and foliage; also a sheet of lettering. (c) For the School of Decorative Painting:—drawing in charcoal of antique figure, broad masses of shade only to be indicated; an anatomical study in charcoal of the same figure about one-third life dimensions; life-sized drawing in charcoal from life of the head and arm, broad masses of shade only to be indicated. (d) School of Sculpture and Modelling:—drawing from antique, from life, and anatomical rendering in pencil. Examinations or tests of candidates follow these lines.

CRAFT CLASSES.

Students of the Upper Division are selected for instruction in one or more of the following subjects or of such others as are from time to time included in the work of the College:—Etching and Engraving, Stained Glass, Tile Painting and Pottery, Writing and Illuminating, Tapestry Weaving and Embroidery, Stone and Marble Carving, Furniture Decoration, Wood Carving and Gesso work, Metal work and Enamelling.

The primary object of the Craft Classes is to afford students an opportunity of becoming practically acquainted with the capabilities and limitations of the materials in which their designs would be carried out. Before entering any of these classes, students must either be students in the related School of the College, or have already passed through that school.

In the School of Design and Crafts, practical workmanship in different classes is taken concurrently with the general drawing work of the studio, and

every advanced student of design will be expected to make himself proficient in the technique of one craft.

Craft Classes are already established in the subjects named above. All advanced students of Design are expected to specialize their studies with a view to perfecting themselves in one branch of art and coming into touch with special forms of industry. With that object they may be required to attend the demonstrations of the Craft Classes, and to engage in practical work of a certain number of subjects. Such special knowledge will be equally valuable to the teacher and the designer. Every student of design is required to make series of careful studies in the Museums.

The following subdivisions are suggested, but there may be some interchange of studies:—

- I. Decoration, stained glass, mosaic, tapestry, etc., involving figure composition.
- II. Cabinet work, house decoration, pattern painting, stencils.
- III. Pottery and porcelain design, majolica, etc.
- IV. (a) Printed stuffs, wall papers, etc.; (b) textiles, embroidery, lace, carpets and damasks.
- V. Gold and silversmith's work, jewellery, enamelling, etc.
- VI. Modelled and carved ornament, in stone, wood and plaster, Gesso work and gilding.
- VII. The book and its decoration, illustrations, borders, type, initials, title pages; illumination and lettering, wood engraving, photographic reproduction, lithography, etching; book-binding, cloth covers.
- VIII. Metal work in wrought and cast iron, lead, brass, etc.

As far as possible students of the 5th year are afforded facilities for getting into touch with manufacturers.

Etching and Engraving Course.—Students in this class are required to work practically at one or more of the following methods of engraving, viz. Etching, Aquatint engraving, Line engraving, Mezzotint engraving, Steel-facing and plate printing. Tools and materials are provided.

Stained Glass Course.—The students being already trained draughtsmen and painters, the teaching is mainly directed towards the acquirement of a knowledge of the craft, and especially of craft limitations as affecting design and execution. The actual technique of painting and lead-working are therefore taught in the ordinary class lessons, and the direction and application of them in the special weekly lecture or demonstration.

Pottery Course.—The object of this class is to illustrate in a simple and inexpensive manner principles and facts relating to the making and decorating of Pottery—enabling students to design, make shapes, and decorate them, with a knowledge of the requirements of this important industry.

Other Courses.—There are also courses in writing and illuminating, embroidery and tapestry weaving, marble and stone carving, furniture decoration, wood carving and Gesso work; metal work and enamelling.

The number of students in the College at any one time varies from 180 to 200, in addition to the few who attend as external students for the etching and craft classes only. About half of them come from London, or from the urban areas of three large industrial counties—Yorkshire, Lancashire and Stafford-

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shire. The remainder come in small numbers from other counties, and occasionally from Scotland and Ireland and other parts of the British Dominions. From time to time a foreign student is admitted. The age range of the students is a wide one, extending from 15 to over 40.

The total cost of the establishment is about £13,320, and the fees received amount to about £800.

RECOMMENDATIONS OF DEPARTMENTAL COMMITTEE.

An investigation was made into the work of the Royal College by a Departmental Committee appointed by the Board of Education at London, and their recommendations in 1911 were:—

(1). That the training of designers for the manufacturing industries should be specialized, and this work undertaken by provincial colleges of art, each devoting special attention to the needs of the dominant local industry, associating representative manufacturers and artisans belonging to such industry.

(2). That these provincial colleges should be conducted as departments of colleges which deal with the practical and scientific as well as the artistic sides of such industries.

(3). That when such system of provincial colleges is established, the relation of the Royal College of Art to them should be that of a school of advanced studies only, providing courses of one or two years' duration adapted to the individual needs of its scholars and in close relation to the Victoria and Albert Museum.

(4). That the training of teachers of art, wherever undertaken, should be conducted under conditions involving a higher standard of general or technical as distinct from artistic attainments, and including an adequate pedagogic preparation.

(5). That Universities should be encouraged to provide suitable degree courses for intending artists, architects, and teachers of art.

EXHIBITION AND COMPETITION FOR DESIGNERS.

The Committee anticipated that the recommended changes would rather add to than detract from the importance of the Royal College, because as a post-graduate college in close touch with art schools throughout the country it would have for the first time a well-defined position as the culminating point of the whole system of industrial art training in England.

There is annually held at the Royal College of Art in London a competitive exhibition from art schools throughout Britain, which gives evidence of constant and substantial progress in all lines of industrial art. Some of the provincial schools of art are doing remarkably well, and have become so strong that it has been proposed to discontinue the exhibition from the provincial schools, and to specialize on the work of the Royal College itself.

It appears from the report of the Departmental Committee that there is keen competition for designers among manufacturers of the innumerable articles of personal wear and domestic plenishing which constitute the staple of that section of British trade which is in any way dependent upon art, and also among the large furnishing and decorating houses. Designers who are thoroughly competent from the trade point of view can command liberal salaries. At present the needs of the industries are met in various ways; many designs are supplied by architects or other artists who have turned their attention to industrial art; many are purchased, especially in the textile centres in and about Manchester and Bradford, from French designers. Thus the Calico Printers' Association,

who spend £37,000 a year in designs, maintain 16 designers in full work in Paris as well as 38 in London. Designs prepared in England supply the Indian market; those from Paris the markets of England, Europe and America. The Wallpaper Manufacturers' Combine is said to prefer German designs for technical adaptability, and French ones for artistic skill. Some British firms which employ regular designers train them in their own drawing offices, while others find a supply in the local schools of art.

COURSE IN TEACHING.

The instruction given at the College in methods of teaching relates to the art instruction recognised by the Board of Education as given in elementary schools, also Schools of Art for advanced and Honors Examinations, and for the National Competition. Students who enter the College with the intention of becoming teachers attend lectures given by the Principal on methods of teaching, and, as part of their training, give instruction in the College under his direction. The period of training given in the methods of teaching is spread over the whole course of a student's college career, and is intended to fit the student on leaving to become a teacher and to grapple with the various points that may arise in dealing generally with art instruction as above described.

The teaching power of each Student in Training is taken into account in awarding Travelling Scholarships and other prizes; and any Student in Training who does not show a capacity for teaching is not allowed to remain in the College as such.

The lectures treat of the following subjects:

I. The history of drawing as a means of education: the works of Rousseau, Pestalozzi, Froebel.

II. The necessity for the Art Master making himself acquainted with the system upon which pupils have been taught before entering the School of Art.

III. Review of the subjects taught in the School of Art and examined by the Board:—

(a) Division of the teaching between lectures, class work and individual instruction. (b) The life class, not an end in itself; its relation to other branches of work. (c) The limitations of paper work and the beginning of craft work. (d) Craft Classes: their relation to the classes for design, the general work of the School, and to manufactures. (e) The mistake of neglecting general education in the Art Student.

IV. An analysis of the system of instruction in the Royal College of Art.

V. School Management:—

(a) Furniture, fittings, &c. (b) Arrangement of class rooms, casts, school museum, library, photographs, &c. (c) The Head Master; his duties to his Committee, his staff and his students. (d) Necessity for the staff continuing their studies, or practising some special branch of art. (e) Schools of art and their influence—(1) on the locality generally; (2) on manufactures and industry. (f) The relations between Schools of Art, Technical Schools, and Art Classes.

VI. Foreign methods compared: Primary and Secondary Schools, and Schools of Art in France, Germany, and Austria-Hungary. The *Ecole des Beaux Arts* and the *Ecole des Arts decoratifs et d'Art industriel*, Paris, and their influence.

AWARDS.

The following awards are tenable at this College:—

A *Royal Exhibition* worth £60 a year for three years, and free admission to lectures and instruction in approved College.

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A *National Scholarship* worth £60 a year for three years, free admission to lectures and one or more Craft Classes, and such instruction in one of the Schools of the College as may be approved for the scholar. As a student of the College a holder of either of the above may become eligible for Royal College of Art Scholarship, 30 shillings per week and free tuition.

A *Free Studentship* admits for two years to lectures and instruction in one of the schools of the College.

Holders of the three foregoing awards have free transportation to and from London.

Local Exhibitions, to which the Local Education Authority contributes not less than £25, and the Board of Education not more than £25.

Art Teachers selected for Special Studentships, £60 a year and free instruction in courses to which they are nominated.

Four Junior Scholarships of £15 each and free tuition for one year only, to students who show special merit in their work during the session.

A *Travelling Scholarship* of £50 may be awarded annually in each School of the Upper Division, to the best student who has been at least four terms in the College, has spent one term in the School of Architecture (unless previously qualified in that subject), and has been at least three terms in the Upper Division of one or more Schools.

Students in receipt of maintenance allowances, who are specialising in one or two Schools of the College, may be allowed in their last term to do their own work in afternoons either in College or outside, and to take advantage of opportunities of establishing relations with manufacturers and others engaged in practical work.

Prizes of approved books, certificates of merit and a special prize of the value of £5 may be granted to students who show conspicuous ability.

LITERARY COURSE.

All students are required to attend the lectures of the Literary Course, to write essays on various subjects connected with the lectures, and to attend the French or Italian Classes held by the Lecturer, unless they already show a competent knowledge of either of these languages.

Lectures are delivered on Crafts, with special reference to the collections in the Victoria and Albert Museum, and on Costume, Armour, etc. The general history of Art is dealt with in a four years' course of lectures.

All students are required to attend the classes held by the Lecturer for the discussion of the subject matter of the lectures and for the revision of the students' notes.

Every student of the College is expected to execute a pictorial or decorative figure composition once a month as home work; the subjects are selected from the literature of the period which is being studied in the lectures. The compositions will be hung in order of merit and criticised by the Professor of Painting and Mural Decoration.

SECTION 2: VICTORIA AND ALBERT MUSEUM.

The South Kensington Museum was opened in 1857 by Queen Victoria and the Prince Consort, to whose foresight the whole scheme was largely due. In 1897 Queen Victoria laid the foundation stone of the Victoria and Albert Museum, which was opened by King Edward in June, 1909. Grants of money are made each year from Government funds for the acquisition of objects, and many very valuable gifts and bequests have been added to the treasures of this Museum.

The Circulation Department of the Museum supplies art schools and museums throughout the United Kingdom with the finest specimens of textiles, wallpaper, jewellery, pottery, and industrial art in its various phases. The unique and ample resources of the Victoria and Albert collection are drawn upon for the supply of some 200 art schools and nearly 100 permanent museums. Where but single specimens of articles exist or the articles themselves are too precious, replicas of them are made by a staff of skilled art workers employed in connection with the Museum.

Groups of students of the Royal College of Art study at appointed times in this Museum, under the guidance of the instructor of the Division in which they are working.

CIRCULATION DIVISION OF MUSEUM.

One of the primary objects, when the South Kensington Museum was originally founded, was the assistance to be given to the various Art and Industrial centres of the country by means of loans of objects and designs. From the earliest times this object has been kept in view, and loans are now made to Museums, Exhibitions, Schools of Art, and Art Classes in England, Scotland, Ireland and Wales.

LOANS TO PERMANENT MUSEUMS AND EXHIBITIONS.

Many of the cities and towns of the country have large permanent Museums and Art Galleries, and in connection with these application is made to the Authorities of the Victoria and Albert Museum for a loan of cases of art objects, such objects to comprise those which may be of use for design purposes for the various industries carried on in these centres. Such Museums after being inspected by the Authorities receive on loan floor cases (generally 4 in number) of art objects, which objects are changed every 12 months. For temporary Exhibitions similar objects are also lent, but naturally only for a shorter period. At the present time the Board are lending to no less than 95 permanent Museums.

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LOANS TO SCHOOLS OF ART AND ART CLASSES.

In the Circulation Division of this Museum there have been brought together nearly 10,000 frames of reproductions of art objects, in plaster, wood, metal, etc., together with designs—originals and copies—in connection with all the branches of industrial art; they are available for loan to the various art centres.

In connection with these loans, the Art Masters themselves, some weeks previous to the opening of their respective schools, call upon the Officers in charge of the Division, and consult with them as to the class of objects which could be lent. The Art Masters are then enabled to choose the various framed examples for themselves, each Master selecting according to the special branches which he is proposing that his students shall study during the ensuing term. Lists having been made of such selections, these are sent to the Schools of Art in the various parts of the country early in September and remain on loan for 3, 6 or 9 months, when the whole of them are returned to South Kensington.

There are also available for the use of the Masters, various series of lantern slides suitable for lecturing upon the industrial arts, together with a Library of advanced Art books.

MONEY GRANT IN AID.

Parliament in 1881 voted a sum of £1,500 to be expended by the authorities of the Victoria and Albert Museum towards the purchase of reproductions, in plaster or by electrotpe or other process, of objects illustrating architectural, ornamental, and other decorative Art, in sums amounting to not more than 50% of the purchase price of such objects as were approved by the authorities.

This vote is still continued annually, varying in amount from £750 to £1,500.

By this means the Committees of local Museums have been enabled to gradually build up sections of various Arts and Crafts, etc.

This system of aiding Museums by money grants has been carried on until the present time, and has been the means of encouraging the Local Museum Authorities in the improvement of and addition to their Museum of objects of Art.

SECTION 3: ART INSTRUCTION UNDER LONDON COUNTY COUNCIL.*

The scheme of work in schools under the London County Council is carefully organized with a view to giving proper instruction in art from the beginning of the subject in the Infant Departments to its development in the very specialized work of the great Art and Technical Art and Craft Schools and Colleges. Young children spend the maximum time at this subject compatible with their general education, and those showing ability receive special attention. Any child showing marked talent has its art education developed along practical

* Condensed from paper by Mr. A. C. Christie, Chief Inspector.

lines, without neglecting its general education. Children on leaving school are encouraged to attend evening classes, and through these to pass to more advanced studies, which latter must be so arranged as to co-ordinate the claims of art, commerce, manufactures, and above all, education. Such is the problem, in the solution of which the Council is constantly adapting its machinery to new circumstances.

In Elementary Schools—lower, intermediate and higher—all children spend a stated time each week in drawing, either under their ordinary teachers (who are required to have some knowledge of this subject), or under specialists giving their whole time, who take the classes in succession in a specially equipped room. In some schools a “peripatetic” art teacher takes classes of the best children on certain days, thus ensuring special teaching for those children who can profit by it.

DRAWING IN INFANT AND ELEMENTARY SCHOOLS.

The work of the infants' schools is often very bright and interesting, showing wonderful observation and imagination. As much work as possible in all classes is done from nature, simple and familiar objects being used, and drawn from sight and memory, the latter work forming an important part of practice. Drawing to scale from measured objects, geometrical drawing and elementary design are also included. In some Elementary Schools careful modelled work from plants, shells, etc., is done, of which photographs are shown, and there is also a small selection of typical sets of drawings made in connection with the wood and metal work manual training workshops of Elementary Schools.

Drawing is taught in the “special schools” for children mentally or physically defective, and is regarded as a useful subject for this type of child, much interesting and intelligent work being done. Scholarships giving free education and travelling expenses are awarded annually to crippled or deaf and dumb children, tenable at Art or Trade schools, thus enabling such children to learn a trade suited to their capacity and health.

Special scholarships are awarded by the Council to clever pupils who proceed to Art and Craft schools, and a certain number go on to Secondary Schools.

TEACHER TRAINING.

The majority of these scholarship holders intend to take up teaching. The Secondary School art course is but a poor equipment for art teaching, and many students take a further course and pass the Board of Education examinations, either from the Training College or from Evening Classes or special School of Art classes.

Special classes are held during the winter for elementary school teachers, and are attended by large numbers, women teachers especially appreciating them. These classes particularly appeal to the teachers of infants' departments and boys' and girls' schools, a careful series of studies being made from plants and real objects in colour, chalk and charcoal, and a certain amount of design and copying being taken, in addition to elementary drawing.

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The permanent and "peripatetic" teachers are well fitted for their work, being Associates of the Royal College of Art, or holding the Art Master's certificate. Many are professional artists or designers who spend four or five mornings or afternoons a week teaching. Some of them have charge of evening continuation art classes.

EVENING ART CLASSES.

These are of two kinds—the ordinary "drawing" class for children and young people in business, preparatory to more advanced work; and the evening Art Centres, at which the work is fairly advanced, many of them being largely attended. The work covers all the elementary School of Art subjects, with a few craft subjects such as embroidery or wood-carving, and the object is to provide for students between the age of 14 and the time of their taking up some definite line of work in one of the Evening Art or Technical Schools. They are held in Elementary Schools, and thus form a link with the Day School, making it easier to draft the children into them. Once they have acquired the habit of evening study, they go on to the Art and Craft Schools. All evening courses are closely co-ordinated, and the Art Centres and drawing classes brought into close connection with the schools to which they send their more advanced students.

ART WORK IN SECONDARY SCHOOLS.

Secondary Schools in Great Britain are not necessarily supplementary to the Elementary Schools, but rather parallel to them, only going on further and being intended for children of a better social position. They are differentiated by the fees charged. Schools are specially organized to provide commercial, technical or craft education. The art work in Secondary Schools is somewhat similar to that of Elementary Schools, but of much wider scope. A great deal of very interesting work is in progress, sometimes frankly experimental. The syllabus of all types of Secondary Schools includes drawing from plants, from nature and natural history specimens, and from all kinds of objects, in pencil, colour, chalk, and pen and ink. The boys do special exercises in drawing and geometry in connection with their wood and metal work, and the girls sometimes do embroidery from their own designs, made under the Art Master's supervision, the art class work and needlework being co-ordinated.

Drawing from prints and photographs or casts of ancient tiles, tapestries or carvings is practised; photographs of architecture and sculpture are looked at, drawn and discussed; and exercises in lettering are done from Roman and Gothic models. This work is sometimes co-ordinated with literature, selected passages being written out and decorated, but writing has not yet come under the supervision of the art teacher. Simple geometrical designs are worked out and coloured, and more elaborate designs, either conventional or with naturalistic or floral ornament derived from models in museums, are produced in considerable quantities. Original illustrations of literature lessons are attempted

and little figure sketches from life, of fellow pupils, are made in pencil or colour. In short, the child is introduced to as much Nature as may be, and encouraged to see what is interesting in ancient Art, both from the artistic and historical point of view, this part of the course being sometimes closely co-ordinated with history.

SCHOOLS WITH ARTISTIC BIAS.

Most schools have a properly equipped art room, in many cases excellently furnished, and containing carefully selected photographs, casts, and coloured reproductions, collections of shells, butterflies, etc., and plentiful flowers and foliage, an admirable and most stimulating environment.

In some of the boys' schools, the drawing syllabus shows a distinct technical bias, and includes architectural or machine drawing, more stress being laid on it than in schools of the commercial type. Some Secondary Schools, not of a general technical type, provide a course in some definite craft for boys who are for the most part scholarship holders from the Elementary Schools. Such schools as the one for cabinet-making give boys not only a considerable general knowledge of the craft, but also of actual practical work. Their general education is made subservient to the special subject, attaining a practical value and interest thereby that are remarkable. There is a special school on the same lines for silversmithing, and similar schools for girls prepare them for dressmaking and upholstery.

These technical schools are very interesting from the Art point of view, for here a large number of young people take a practical interest in a definite form of Art; placed at a susceptible age under well-trained teachers who are not only skilled craftsmen, but thoroughly conversant with the requirements and practices of trade, such instruction provides a very valuable preliminary education for an apprentice or learner in a workshop. Usually the student, on leaving the day school, continues his studies in one of the evening Technical Art Schools.

ART AND CRAFT SCHOOLS.

The work of the Art and Craft Schools and Colleges is very varied. Their classes are rather sharply divided into day and evening courses, attended for the most part by different students. Although some day students stay for evening work, the great majority of evening students are employed in the crafts or arts in which they seek further instruction, and the teachers usually are also engaged in the crafts, being carefully selected men, not only competent in their crafts, but to teach design. The classrooms, equipped like workshops, are decorated with casts, photographs and other reproductions of ancient and modern work. In all craft classes the traditions of design are preserved, and students encouraged to look out the work of old masters preserved in museums, churches, etc. The Council awards prizes for the best sets of museum studies submitted, these serving as useful examples to other

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students in schools or workshops. This craft or trade side of Art has claimed the very careful attention of the Council for some years, and there are evening classes in a very large number of subjects. Besides the schools devoting themselves to one branch of work, such as building, photo-engraving, and lithography, all Schools of Art have trade, technical or craft classes. Whenever any concentration of a trade in a given locality renders it possible, a school dealing with that work alone is provided.

A large number of scholarships of different values are awarded each year in the Art and Craft schools. The awards are made on actual work done during the session, in order to avoid the evil effect that preparation for a set examination would have upon vitality and individuality.

In the Schools of Art, painting and sculpture are taken by whole-time day students attending courses of several years, who are prepared for careers as painters, sculptors, decorators, teachers, book-illustrators, and the like. There are also plenty of evening classes for life drawing and modelling, and for other School of Art subjects, attended by craft students who can only spare the evenings.

A few typical Art Schools in London are briefly noted in the following pages.

CENTRAL SCHOOL OF ARTS AND CRAFTS, LONDON.

This School at Southampton Row, near the British Museum, was established in 1896 by the London County Council to provide instruction in those branches of design and manipulation which bear on the more artistic trades. The Principal is Mr. W. R. Lethaby, F.R.I.B.A., Professor of Design in the Royal College of Art.

Admission to this School is, within certain limits, only extended to those actually engaged in handicraft, and every opportunity is given to students, to specialise in relation to their own particular calling. The school is intended to supplement, rather than supersede, apprenticeship by affording to students, engaged in the typical London art industries, opportunities for design and practice in those branches of their craft which, owing to sub-division of processes of production, they are unable to learn in the workshop.

The instruction given falls into the following main groups:—

Architecture and the Building Crafts, including architectural drawing and design, lectures on history of architecture, building construction and structural mechanics. Practical courses in stone and wood carving and lettering, iron work, bronze casting, etc., are associated with this section and with the Modelling School.

Silversmiths' Work and Allied crafts, including silversmithing, large and small, goldsmiths' and jewellers' work, diamond mounting and gem setting, art metal-work, chasing, repoussé work, engraving, die-sinking, design, modelling, metal-casting, enamelling and later, electro-deposition and gem-cutting.

Day Technical School for Boys preparatory to the Silversmiths' and Allied Trades.

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Book Production, including book-binding, typography, black and white illustration, writing and illumination, lithography, woodcuts and wood engraving, miniature painting, etching and mezzotint, and courses of lectures arranged with a view to bringing into closer relationship the various branches engaged in book production.

Day Technical School for Boys, preparatory to book production (Printing binding, etc.)

Cabinet Work and Furniture (third floor), including cabinet work, inlaying and marquetry, polishing, upholstery, wood carving and gilding; also design for furniture, workshop drawing, workshop arithmetic, perspective and interiors.

Metalwork for Cabinet Makers.—Facilities are given in connection with the class in *Art Metalwork* to those students who require to design and carry out handles, scutcheons, hinges, etc., for their work.

Drawing, Design and Modelling, including Life and Painting on China. This group is in close relation to all the other groups.

Needlework, including dressmaking, embroidery, etc. Tapestry and silk weaving are added if sufficient applications are received.

Stained Glass Work, Mosaic and Decorative Painting, including painting in tempera, etc.

THE ROYAL FEMALE SCHOOL OF ART.

Incorporated with the Central School of Arts and Crafts.

This school, established in connection with the Board of Education at Queen Square, Bloomsbury, in 1842, was transferred to the London County Council in 1908.

The course of study is intended to train young women who wish to obtain their livelihood in some branch of Art or Art Craft, or to become Art Teachers in Art Schools, Secondary, Elementary, or Private Schools.

Students are thoroughly prepared for the examinations of the Board of Education in May and June, for Elementary Certificate, Art Class Teachers' Certificate and Art Masters' Certificate, Examinations in Drawing, Perspective, Anatomy, Design, Painting, Drawing from the Antique and from Memory, Life, Modelling, Ornament and Figures, etc.

Two Pupil Teacherships are awarded annually, of the value of £15 and free tuition.

Free Studentships for one year are granted to all students who obtain the First Certificate, Art Masters' or Art Class Teachers' Certificate.

Students are prepared for admission to the Royal Academy Schools by careful study from the Antique and Life, and for the Entrance Examinations of the Royal College of Art, South Kensington.

Day classes in Arts and Crafts cover work in addition to the above, in Black and White and other illustration; Lithography, Writing and Illuminating; Miniature painting; Etching and Mezzotint; Carving and Gilding; Embroidery; China painting.

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Visits are made to the Victoria and Albert Museum, South Kensington, under the guidance of teachers, and lectures on various subjects connected with artistic crafts are delivered during the winter months.

THE SCHOOL OF PHOTO-ENGRAVING AND PHOTOGRAPHY.

FLEET STREET, LONDON.

This School costs the London County Council nearly £3,000 a year to maintain. It is open only to those engaged in some branch of the photo-mechanical, photographic, designing, lithographic, engraving, printing and illustrating crafts. There is no provision for amateurs. It supplies cuts to the 6 Printing Schools in London, but does no commercial work, and must not even prepare plates for the County Council. It is the only School of its kind under the London County Council, but there are other similar schools at Manchester, Liverpool, Leeds and Glasgow.

The Courses of Study cover Block Proving, Elementary Photography, Photographic Copying, General Lithography, Map and Plan Drawing, Transfer Writing, Design, Lettering, Drawing, and all Photo-Mechanical Processes.

The Equipment is all first-class. The aim of the School is to acquaint students with all appliances used in good establishments, so that various machines, all arriving at the same result, may be seen in operation.

The Art section of the school should be of especial service to those artists engaged upon work for reproduction, as students in these classes have the privilege of having selected work reproduced, and every opportunity is afforded them of obtaining a knowledge of the various processes and their limitations.

Unemployed members of the craft register at the Labour Exchange and then come to this School to improve themselves, without fee, while waiting for a job.

There is a Sketch Club, the boys doing the work at home, and having it criticized once a month by some distinguished artist.

A large book of finely-executed specimens was obtained by the Commission at this School.

CAMBERWELL SCHOOL OF ARTS AND CRAFTS.

This School is carried on by the London County Council in a beautiful building erected by Mr. Passmore Edwards, and is strong in artistic work in Jewellery, Typography, Bookbinding and Illustration, Architectural Design, Modelling, etc.

Here about 600 evening students and half that number of day students are taught by experts.

Fifty printing apprentices attend for two afternoons weekly, the employers paying for their time and the School recouping their travelling expenses.

A feature of special comment by our Commission was the teaching of special drawing and design in the evening class in typography, pupils being taught to draw letters in pen and ink and arrange them in tasteful orders, and also to design simple ornaments. This work has great effect in giving printers ability to set "display" type to advantage.

SECTION 4: PROVINCIAL SCHOOLS OF ART.

The work of students of Provincial Art Schools goes to London for the National Competition. The Headmaster is supposed to send nothing up for competition but what he considers work of excellence. At one time everything done was sent up, but now all preparatory work is excluded and only specially picked work is allowed to go.

The prizes go to individuals, the institution not getting the credit; but the awards substantially influence the grant from the Government. In a measure the variableness of the amount depends on the competition. A Government Inspector resides in the district and may visit the Provincial School any day in the year and make inspection. There is also a rather serious inspection triennially when half a dozen Government officials go down for a few days and see the actual work going on in the schools. Formerly the grants were paid on the basis of what the pupils did under examination. Now block grants are paid on the general character of the work of the School.

The work of Schools of Art, in the opinion of Mr. Haywood Rider of Leeds, has undergone an enormous change, mainly in making the work more practical—what is called Craft Work. These schools are just beginning to make themselves what they were really intended to be when started 60 or 70 years ago. Formerly everything was done on paper, and the Government seemed to think the work would find its way from the schools into the industries through that channel. It did not do so. Work today must be actually practical, and if such work is not taught from the beginning, the student will not attend. There is so much competition that if not shown that his trade will be influenced he will take no interest in it.

VALUE OF ART SCHOOL TO INDUSTRY.

Schools of Art are now recognized on every hand as a very important item on the industrial side, and their use is recognized by everybody as helpful in every way to the general public and manufacturers; this Mr. Rider could observe was increasing every day.

The substance of further information obtained by "conversation" with Mr. Rider is as follows:—

There is no line of demarcation between students who come for efficiency in the fine arts, such as painting and sculpture, and those who come for application of beauty to crafts. The number of students in fine arts is gradually decreasing; and because the practical spirit is in the air, the fine art type of student does not exist today as he did in large numbers 10 or 15 years ago.

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The authorities in charge of these Art Schools feel that they are chiefly responsible for the development and maintenance of the esthetic sense in their communities. There must be some responsible person to see to questions of taste and good design, as these cannot be got in many cases from men of general training. The question of taste ought to rule very largely in all Art work in a new country like Canada, which it will affect more than it would an old country like England, which, because of its traditions, has to be always looking back and not forward. Those who are responsible for Canadian Art must be very keen in watching for the development of taste.

Mr. Rider thought there was not enough dwelling on the past in order to maintain a high standard of taste. We must go to the past and dig up the best and make use of it. That is so on all hands. On the question of taste it would be better for Canadians to keep their money in their pockets than to encourage any form of art that would lead to anything that was not really sound. He did not know whether the Dominion would get a lot of art that it would be better without—very vicious and very nasty—or whether they would get something worth having to put into the Canadian industries. This was really the most important aspect of the whole problem. Better shut out art altogether than give way in the matter of taste. "Better keep your money in your pockets than spend it on bad art; that is all devilish".

(1) INDUSTRIAL ART IN LEEDS.

The entire scheme of art instruction in Leeds is logically arranged, from primary to professional work, and is very strong throughout in insistence on fundamental principles and sensible practice; close relation to industries; correlation of exercises, material and methods towards industrial utility combined with beauty. Manual training, Botany and Nature Study are utilized for and permeated with instruction in the principles of Art. The teachers have evidently ability as well as enthusiasm, while the Principal of the Central School of Art, Mr. Haywood Rider, A.R.C.A. (London), has a merited reputation for exceptional strength of character and tenacity of purpose.

Great importance is attached to the course of instruction in the Preparatory and Branch Art Schools. In the former (held three evenings weekly) the study is based on examples having vitality and interest, so as to stimulate and encourage beginners to further progress. These courses lead to more advanced instruction in Art and in the allied crafts as given in the Central School of Art. Students are not allowed to produce works for the adornment of their homes or the delectation of their friends. They are expected to follow a course of serious study which will serve as the ground-work for their future advancement in Art and its applications to industry.

The connection of the art work in Branch Schools with that of the Central School of Art is aided by occasional special exhibitions of advanced art or craft work in the latter, and by lectures and demonstrations by the Principal and teachers of the Central School which students in Branch Schools are allowed to attend.

Examples of advanced work done by pupils in the Central School are loaned to Branch Schools so that high ideals and a high standard of accomplishment may be constantly before the students. By bringing out clearly the connection between the Branch and Central Schools it is hoped that students may realize and appreciate the possibilities of advancement in Art Work offered to them, and that by thus securing definition of aim and continuity of purpose distinct benefit may accrue both to the individual and to the city.

CENTRAL SCHOOL OF ART (LEEDS).

This school, devoted to the training for art application to industries, plans in every possible way that all study shall lead to some useful and practical end. In order to accomplish this, every facility is provided, so that side by side there shall be not only study in Principles, Draughtsmanship and Design, but that these shall be applied in a practical way in the Craft Studios of the School to the various Art Handicrafts and Industrial Arts.

Students are desired if possible to take up some branch of Craft Work so that they may realize the application of their particular studies to practical work. The importance of a thorough understanding of both the design and craft sides cannot be too highly estimated, and it is only by a knowledge of craftsmanship that the artist can hope to design suitably to the purpose in hand.

In the case of Cabinet-making, Bookbinding, and other technical subjects, the aim is to give the student a thorough grasp of every part of his trade or craft.

The Departments are: Architectural, Design, Modelling, Life Drawing and Painting, School of Instruction in Primary Drawing, and Various Craft Schools.

The curriculum embraces all the requisite subjects in these six Departments, and in conjunction with them equipment and instruction are provided for the following Crafts:—Bookbinding, Cabinet-making, Embroidery and Lace, Enamelling and Jewellery (including Repairs), Lithography, Mural Decoration, Pottery, Painters' and Decorators' work, Metal work, Wood and Stone Carving, Illustration work (all modern processes), Wrought Iron work.

Practically no qualifications in regard to ability to actually draw are required on the admission of students. As a rule the school does not get them under 13 or 14, and nowadays people can draw passably the preparatory things. Students aged 17 or 18 who do not have that ability are admitted. There is no entrance test by examination; students are on trial for three months, and if they show no artistic ability they are then turned away.

Night students pay 7s. 6d. a term for three terms a year. In some instances fees are paid by employers, who will act generously if they see that the school can help their people practically; at present about 36 pupils are having their fees paid.

INSTRUCTORS, CRAFT-WORK, EXHIBITIONS, ETC.

The instructors are successful craftsmen who have had teaching experience. Mr. Rider considers them of little use if they are simply craftsmen. Their

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teaching power is helped by the experience they gain at the school, for as the students do not require much discipline, and their general art training is sufficiently advanced, they only need the technique to be shown them. A technical man always works alongside the design master and the general masters. The Comission found that the teacher-in-training in iron work had been awarded a travelling scholarship by the Leeds Committee, after he had won a prize in London, and had thus been enabled to go to Spain, where there is a great deal of beautiful iron work *in situ*.

In the jewellery department young girls, just emerging from the elementary schools, were doing fine work from their own designs.

The printing department is well equipped, having 200 point-type faces, and 2 tons of lead altogether, all this being on loan from Haddon & Co., type founders. Lectures are given to 300 printers in the Assembly Hall.

Art pupils submit designs to employers, and profit financially by exhibitions. Clay-modelling pupils have to copy a cast, and in a specified time make a cast from it for educational purposes. The various departments design Christmas cards, which are printed and sent out to people in the district likely to be interested in the school and to help it.

The support of the School of Art began with the art-loving people, backed by the Government, but now the municipality are responsible in every way, and they are very steady in support, sympathy and interest; yet in actually carrying out much of the detail work there is always a certain section of art-loving people who do a big share.

Mr. Rider, referring to the National Exhibitions, said he did not think the winning of scholarships had any influence on the management to exclude students other than those specially bright.

The lithographic has been developed a good deal in Leeds; the standard has been raised by the Art School. The Jewellery department of the school is very strong; so with bookbinding. The Art School authorities have many talks on the question of designing furniture on simple and artistic lines for workmen's homes, showing how it can be done cheaply and yet tastefully.

TRAINING OF TEACHERS, RESEARCH, ETC.

Special courses, running two hours twice a week for two years, are given to teachers who are to take art classes in the Elementary Schools of Leeds. The teachers pay fees, and appreciate it better, there being twice as many applications as can be taken, and a better quality of work done. The better the teacher is qualified, the better chance he has of work. In exceptional cases an increase of £5 or £10 is given for all-round ability. One teacher from each school is selected, and thus the influence is spread to all. A teacher taking an Art Course at this school would be the leading one in a conference on Drawing, and thus the influence of the school is reflected all through the city.

The Leeds School of Art cost in 1911, £4,825, of which £2,737 was for salaries. Against this the Government grant was £1,680, local rates £1,713, and fees from pupils £1,295. Of the latter sum, students themselves paid only

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£478, the Leeds Education Committee gave (in scholarships) £795; the balance came from other public bodies.

There is a growing use of this school as a research laboratory by manufacturers for fine designs for things they are making. Only the day previous to the Commission's visit Mr. Rider had a designer in a firm of textile printers come for an assistant, and it is a regular thing to receive applications for either designers or workpeople.

Advisory Committees in every trade are in close touch with the school and behind the regular departments; they are made up of employers, foremen and actual workers in shops, each representative being selected by his colleagues. These Committees meet with the Board as often as required.

This School of Art has assisted in the development of existing industries, and both employers and workpeople show by backing it up that it is a great help to them.

WEST LEEDS HIGH SCHOOL.

The art work in this school is conducted by Mr. F. G. Boase, A.R.C.A., who co-operates with Mr. Osborne, the Manual Training teacher, and together they produce very fine results, all the wood work being saturated with artistic ideas.

Mr. Boase said he never had any trouble in handling the pupils, although he gets 400 every week, because they find the work so interesting. He has never yet had to turn one out of school for inattention or bad conduct.

Mr. Boase keeps constantly on exhibition on the wall of the art room fine specimens of work by the Old Masters, and gets the boys to bring prints. Pupils' work is also selected, and the best specimens are shown on the walls. He also arranges for the art critic of the "Yorkshire Post" to conduct the students through the art galleries and talk to them about the pictures, and when the boys return they give a report on what they have seen. Art compositions by the boys are put into a MS. magazine conducted by them. Between 300 and 400 specimens of home work are done spontaneously, no marks being allowed for this.

This school gets 8 scholarships for the Leeds Central School of Art; then students go from there to the Royal College of Art in London. Eight former students are now employed in the arts.

Art work is related to needlework by close consultation with the teacher of that department, and Mr. Boase keeps in personal touch also with the evening school.

MANUAL TRAINING DEPARTMENTS.

Mr. Osborne uses "models" at first in order to give control of the hand, and for foundation work, but he does not insist upon absolute accuracy; to do so he says, would be to deaden feeling, and what he wants is spontaneous action. He relates the wood work to the activities of the school by making articles the school needs, and relates it to the home by allowing the children free play. He is strong on art.

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Mr. Osborne appoints one boy as foreman over 6, and they do a great deal of communal work. The tools are kept in lockers, to which the boys have keys; the tools include surveying instruments, sight markers, etc. The boys were making aeroplanes at the time of our visit.

(2) MUNICIPAL SCHOOL OF ART, MANCHESTER.

The objects of this School are to give, by a system of carefully considered and varied courses of study, with due regard to the bent and capacity of individuals, a thoroughly practical knowledge of Designing, Drawing, Painting and Modelling, more especially in the various forms of their ornamental application in association with Architecture and the technical conditions of manufacture. It offers not only a useful elementary training to those without previous knowledge of Art but also a helpful system of study sufficiently complete to be valuable to both designers and craftsmen, as well as to those who desire to pursue design in its more strictly graphic and pictorial directions. A further object is to assist those who desire to make a knowledge of Art a part of their general education; also to give facilities for the training of persons who intend to adopt Art as a profession, or to include it in their qualification as teachers in public elementary or other schools.

The Courses of Instruction comprise an Elementary Course, Painting, Modelling, Figure Drawing, Painting and Composition, Architecture, Design, Classes in Art Craftsmanship, Metal work, Enamels and Jewellery, Wood Carving, Embroidery and Stained Glass. Both Day and Evening Classes are held.

MUSEUM OF ART AND HANDICRAFT.

A Museum in connection with the School, founded by a gift from the profits of the Manchester Royal Jubilee Exhibition of 1887, comprises three large rooms equipped with characteristic objects of artistic skill or handicraft, either original or in fine reproductions. This fine collection is at the service of the students and public, and forms a Library of Applied Art such as is not available to the students of other Provincial Schools. The three rooms are designated as the Textile Court, Gothic Court and Italian Court. The first contains a tapestry designed by Sir Edward Burne-Jones and executed by William Morris, a typical collection of Turner drawings, cartoons for stained glass windows, Greek vases, glass, reproductions of early work, medals, coins, etc., and other art treasures. The Italian Court contains illustrations and specimens of Italian Art; the Gothic Court, casts and reproductions of early Runic Crosses, Gothic Architecture, and similar work. There are also collections of majolica ware, pottery (ancient and modern), glass, Chinese porcelain, Japanese colour prints and bronzes and other Oriental work, as well as specimens of famous modern pottery such as Wedgwood, etc., and modern textiles.

LIBRARY LECTURES, PRIZES, ETC.

There is a reference library and reading room.

Series of free illustrated Lectures are delivered to craftsmen, teachers and others during the session. Such subjects are treated as:— Art Education in Elementary Schools and Schools of Art; its relation to general education and industries; the functions of a School of Art Museum; the art of the craftsman in various kinds of craft work; the training of the craftsman; relation of the art school to the workshop; Drawing as a means of vivid illustration, and its application by the teacher.

Design is taught in its technical applications; plants and animals are studied in their relation to design, and drawn and coloured from nature for design. There is a course in Furniture and Interior Decoration. Special courses are given on Saturday mornings to teachers in elementary schools; Marble Carving is taught to advanced students.

There are numerous prizes in all departments, and Scholarships are also awarded, one being a Travelling Scholarship. These scholarships are provided partly by private gifts, partly by the Board of Education, and partly by the Governors of the Royal Manchester Institution.

(3) ART TRAINING IN LEICESTER.

The Art Department of the Leicester Municipal Technical and Art Schools is well equipped, staffed and managed.

This school has worked for some years by teaching and lectures to raise public interest in Civic Art. Keeping in mind the recently passed Town Planning Act, it hopes through students preparing as architects and builders to develop good taste which will manifest itself in the building of chimneys, bridges, terrace houses, allotment garden houses, lamp and tramway poles, and the like. It is considered possible under the new Act to do much towards conserving desirable things and preventing undesirable planning and building. The School keeps a sharp eye on changes in the locality, and calls attention to alterations contemplated in the neighbourhood of the School in the hope of developing these, as well as the approaches and surroundings of a proposed new park pavilion, into striking and beautiful points of interest. Attention is also drawn to the increase of aggressive advertisements which have in many cases destroyed the beauty of the town, neutralizing the esthetic effects of the fine architecture, besides being poor in design and causing untidy litter. These things, the Principal points out, dull public interest in civic betterment and discount private efforts to improve the city's appearance.

The continued endeavour to focus the art work on practical issues has given additional life and value to the courses of study in each department of the School. Without losing sight of the value of preparatory, and to some extent of academical exercises, the educational opportunities afforded by processes of practical work have been developed.

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SPECIAL MUSEUM FEATURES.

The School Museum is a special feature here. The practice is for the examples, and framed specimens exhibited in the school corridors, to be used to illustrate a particular subject, such as the history of sculpture and architectural ornament. Beginning with Japanese work, a series of photographs and casts illustrates the development of sculpture up to the present time. A pamphlet with notes on the exhibition was printed and circulated. Apart from the value to the general art student of these annotated and easily understood picture sequences, a large number of the general public visited the exhibition, and thus their taste was improved. A large number of drawings done during the summer vacation by students of Secondary Schools, forms part of the exhibit at the Museum.

About 800 pupils of city schools visited the exhibition, and one or more members of the Art School staff went around with them and in an informal way helped to make clear the interest attaching to the exhibition. On one occasion the exhibition consisted of a collection of exercises selected by the Japanese Government for the purpose of showing art work in the various grades of the Japanese schools: this work being different from that done in Leicester was useful for purposes of comparison, and as illustrative of technique was perfect within its limits. The school has also had the benefit of a selection of designs and studies which had been awarded medals and prizes in London at the National Competition of Schools of Art. Besides drawings and casts, this selection included industrial work of various kinds, and the students thus had an opportunity of seeing what other centres were doing and of appreciating the standard to which the work had been raised.

An illustrated pamphlet was issued containing drawings made by students of the school relating to the Leicester Coat of Arms, notes being added by an expert in heraldry. These notes and drawings have long been wanted by printers, painters, etc., who use copies of the Borough Arms.

COURSES IN CLOSE RELATION TO TRADE.

The courses of study are arranged so as to follow in a definite manner such local industries as lend themselves to the influence of the school, and there is evidence of the beneficial influence it has had upon them. An important factor is the connection existing between certain local trade organizations and the school.

The complete course of training given in the Lithographic Artists' class, after a careful selection of boys, well taught in the elementary schools, leads to the supply of apprentices who, by reason of their training, will improve the general standard of the work.

Steps are being taken to secure youths who have a good school education to become compositors and printers in order to compete with the recent distinct advance in artistic printing evident in the productions which American and German firms are now offering in England.

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The curriculum provides educational facilities for students who can be divided into three groups—Art workers, teachers, and students who take Art as part of their general education. Suitable courses of study are arranged, varying in a convenient manner for such local industries as can be dealt with at the school. There is an Art Course for Secondary School pupils, also one for those who have left school. Courses are given in all these subjects in Evening Classes. In connection with the Art schools, there are many scholarships given, in some cases supplying free tuition, in others involving maintenance running from 5s. to 25s. per week.

The pupils correlate design in connection with the trades. Engineering and boot and shoe students in the Technical School, in the same building, take some freehand drawing. Sign painting is treated as a speciality.

Specimens of printing and lithographic work from this school are very fine.

Metal work, embroidery, architecture, modelling, stonegraving, letter cutting, painting and decorating and sign writing, wood engraving and furniture design are all effectively dealt with.

Art education is given to the pupils through processes of practical work.

(4) BRADFORD SCHOOL OF ART.

The objects of the school are; (1) To train students who desire to follow the profession of artist, architect, designer or teacher of art. (2) To train students who are engaged in, or intend to follow some art trade or craft. (3) To give a general art education, as a means of culture. The school emphasizes the application of art to local industries, especially textiles.

The day course for artists, designers and teachers includes: freehand, model, geometry, perspective, light and shade; painting, design; drawing, painting and modelling from the human figure; drawing and painting flowers, and adapting them to the purposes of design.

The classes for the Training of Teachers include lectures on methods of class teaching.

The Architectural Course is arranged in conjunction with the Department of Engineering, and includes drawing and sketching from casts and objects; drawing architectural details, such as mouldings, windows, doorways; perspective; measuring buildings of architectural importance; study of historic architecture, Greek, Roman, Byzantine and Romanesque, Gothic, Renaissance and Jacobean; architectural design; geometry; building construction; mathematics; physics; levelling and surveying; graphic statics. Students are trained for the R.I.B.A. examinations.

ARTISTIC TRADE OR CRAFT CLASSES.

The Day Course for Students, who are apprenticed to or who intend to follow some art trade or craft, includes drawing, modelling, design, and special instruction in the practical part of some particular trade, including textile design (the practical part being taught in the Department of Textile Industries),

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painting and decorating, wood-carving, lithography, metal work, furniture, plaster casting, etc. Most of these classes are taught by teachers who have a practical trade experience of the craft. Students may be apprenticed to an outside firm and attend half days during the week, or may learn the whole of the craft in this School, working half day at drawing and design and the other half at practical work. The classes are free, but students must give evidence of ability before being admitted. At first only students employed in the trade were admitted to these trade classes, but sometimes the attendance would fall as low as 5 pupils, hence the door was thrown open; but if craftsmen fill the capacity of the class they always have first chance.

Evening Class students engaged in an art trade take courses intended only to extend the knowledge gained in office and shop work, this course being necessarily more restricted than the day course.

All students in Textile work at the Technical College come here for instruction in design. Students from Secondary Schools attend for instruction in Art.

The Principal of the School is Charles Stephenson, A.R.C.A. (London), Gold Medallist and Travelling Scholar of Royal College of Art; Royal Academy, Antwerp; joint author of Text Books for "Geometric Construction" and the Principles of Artistic Design, viz. "Ornamental Design for Woven Fabrics." The Staff has teacher specialists and lecturers on Figure Drawing and Composition, Architecture, History and Design, Decorative Art, Textile Design, Embroidery, Wood and Stone Carving, Lithography (theory, artist and machine courses), Photo-lithography, Chromo-lithography, Typography, theory and practice; Cabinet work (lecture and practical.)

There are practical workshops in Cabinet-making, Painting and Decoration, Typography and Lithography.

COURSES IN LITHOGRAPHY.

In chromo-lithography the course extends over 3 years. The first year is spent entirely at the School of Art; then the student should become apprenticed to the trade, and may continue to attend the School of Art one half of each day for two years. For the remaining period, or last 3 years of his apprenticeship, he should attend the School of Art at least three evenings per week. All necessary material, including a large selection of lithographic stones, is provided for use of students in the practical class.

The Evening Course is so planned that it will serve both for apprentices and those who have passed through their apprenticeship. An additional feature is introduced into this class by making use of the new Photo-Lithographic section. The artists' tone and colour work is reproduced by photographic processes and made ready for the lithographic printer. In this way the artist is able to see the result of his work done by this method. All necessary material, including a large selection of stones, is provided for the use of students. The work done will be proved in the machine class, thus enabling the students at any time to see the result of their work.

These classes in practical lithography, machine printing and photo-lithography being entirely technical ones, only such students are admitted as are engaged during the day time as apprentices or journeymen.

A number of boys in the lithographing department are sent by their employers, who pay them for the time spent in school.

Students must take a full course and pass an examination in each subject before being permitted to enter the following year's course, exceptions being allowed only in case of advanced students, who may take special subjects only.

To meet the requirements demanded by changes and advancements taking place in the lithographic trade, both as regards the artist and the printing departments, the class in photo-lithography gives students in these two departments the advantage of studying the combination of both processes. A photographic studio has been arranged alongside of the lithographic rooms, containing exposing room and dark room, the former fitted with a large half-tone camera and screens, two special arc lamps for exposing and printing, and apparatus for wet and dry negative making. The developing room is fitted with three tanks and other necessary apparatus. Only the older students and journeymen lithographic printers with practical trade experience are allowed to do practical photographic work.

The lithographic workshop is provided with a power press, several hand litho-presses, a copper-plate press, and all other necessary appliances required for the practical working of a lithographic workshop. The class is taught by demonstrations on the power press, and by individual students making practical experiments on the hand presses, also by occasional lectures on methods of procedure, the nature and quality of materials used, and various uses to which they can be put.

COURSES IN TYPOGRAPHY.

In Typography the course is divided into 3 years. Only compositors' apprentices and past-apprentices are admitted. The class room is furnished as a workshop, and contains type of all varieties for high-class printing and display work, also press and all necessary material. Theory and practical work are combined into one course, and students taking the practical work are also required to attend the theory lectures. The courses cover (1) composing for book and job work; (2) press and machine work (single cylinder), manufacture and care of inks; imposing stereotype plates; treatment of paper before and after printing; keeping stock; folding, stitching, stabbing and sewing, etc.; (3) machines—two-revolution, perfecting and rotary; typesetting machines; book-keeping for printers; general management, estimating, etc.

Students are urged to take a course of freehand drawing with the design class, to enable them to sketch out their own designs for display work; also to attend an evening class for grammar and composition, these being most essential subjects for a compositor to understand.

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PAINTERS AND DECORATORS.

In Painters' and Decorators' work, the Apprentice Class, only for day students over 14, is for the purpose of training, in the technique and art of the trade, youths intending to become apprentices to the trade. The class is free to such a student, who enters directly from a day school and is taught both the art and craft of the trade by attending the special Painter-Decorators' Class during the whole of the day for one year.

Students passing the course satisfactorily easily obtain places in the best shops in the city, as applications are constantly made for apprentices. After obtaining a place as apprentice a boy may, if his master consents, continue at school one-half of each day and three evenings per week, working the other half of each day in his master's workshop.

All students must attend the Evening Classes three evenings per week throughout their apprenticeship, and are permitted to continue as Free Students.

The course consists of instruction in painting, graining, marbling, lettering, gilding, designing for decoration, stencil cutting, drawing. The class work is carried on in a large and well equipped workshop, the wall space of which is used by the students for practical work.

The Evening Class is open only to those working in the day time as apprentices or past-apprentices. Students must take the full course, which comprises lectures on tools and brushes; pigments, oils and varnishes; painting, distemper, paperhanging, gilding, bronzing, graining, marbling, staining, decoration, sign-writing, etc. The course covers three years.

One feature observed by the Commission was the painting and decorating and applied design instruction, the work being very remarkable.

CABINET MAKERS' COURSE.

The Cabinet Makers' Course is conducted in a room fitted up as a workshop, having benches, cabinet makers' tools, and all accessories. The class practises cabinet making in all its branches, and is given opportunity of seeing practical illustrations of sound, well-made and artistic furniture. Each individual has the advantage of carrying out all operations under the supervision and guidance of a thoroughly competent cabinet maker. Students who purchase their own wood are allowed to retain the examples made by themselves.

The course covers,—lectures and practical work in the use of tools, forming various joints and processes, veneering, marquetry work, qualities of woods and best method of handling, storing and treating them; methods of making out "cutting orders" or writing off lists of wood quantities from drawings; making "laths" or boards, with details for use in "setting out"; name, purpose and relative standard sizes and proportion of each article and variety of furniture, with description of technical terms as applied to different parts; names and meaning of historical styles or periods of furniture, and method of fixing date of any given example; cabinet metal work of various kind.

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different uses and methods of fixing; the suitable introduction of glass into furniture, and correct methods of fixing plate, mirrors, lead-lights, etc., tiles, marble, etc.; full course in drawing and designing.

NOTES OF INTEREST.

In the Life Model room there is an inverted arc system of lighting combined with an adjustable light operated on a circular hanging rail and directed to the model. This system is used only in two other places in England.

It was found that the Secondary Schools supplied pupils directly to the crafts through the School of Art. The Principal assists students to obtain employment.

It is clearly stated that this is an Applied Art School, applied to modelling, typography, painting and decorating, wallpaper, metal work, woodcarving, life modelling, lithography and textile work. The work of the students on designs for textiles was particularly good.

The students in the Evening Class of Textile Design attend one evening per week, the fee being included in that of the Department of Textile Industries. The subject taken is Artistic Design for Textile Fabrics. The students in all departments appeared attentive and interested.

The Principal said he believed not in teaching geometry as such, but in "doling it out" to the various groups as they were at their own work.

In regard to Wood Carving, it was mentioned that the demand for wood carvers dropped when mission furniture came in, but the Atlantic liners had saved the situation, as they require so much carving.

SCOTLAND.

CHAPTER XII: OUTLINE OF THE EDUCATIONAL SYSTEM.

SECTION 1: INTRODUCTORY.

In educational matters every country has a tradition as well as a history and a reputation. In Scotland the educational tradition is admirable, although Scottish leaders themselves are not slow to state that its excellencies have been exaggerated.

As early as the 16th century there was a marked example of class legislation in connection with Scottish education. It provided that the eldest sons of well to-do freeholders should attend school until their knowledge of Latin was reasonably perfect. Younger sons, the daughters of the well-to-do, and all children of the poor were left out of consideration.

The tradition that every locality in Scotland has had a good parish school for centuries does not tally with the facts. Even one hundred years ago only about one-fifth of the children in Scotland attended schools.

Since that time education has always been comparatively easy of attainment. A convenient school for all was at least the ideal, and there have been plenty of educational endowments to meet the case of the capable but poor scholar. These features have been preserved and made more effective, and now there is ample provision of Elementary Schools where education is free, and bursaries or scholarships to assist any 'youth of parts' to go through the Secondary and even the University courses. Taking in Government grants and private endowments, the sum of about £150,000 is paid out annually for scholarships

EDUCATION DEMOCRATIC, PRACTICAL AND GRADED.

Education in Scotland from the Parish Schools to the Universities has always been democratic in its administration. The people control educational matters locally by the exercise of the franchise and nationally by means of their Parliamentary representatives.

The tradition agrees with the facts in that education in Scotland has always been practical. Importance has been attached to vocational education. As an example, navigation was taught in the schools of the chief seaport towns for more than a hundred years. The existing system has preserved and enlarged this feature. Instruction preparing for crafts and trades may now be obtained in Supplementary Courses and Continuation Classes, and afterwards at Central

Institutions which include Technical Colleges, Agricultural Colleges, Colleges of Domestic Science, Art Colleges and the Universities.

Education in Scotland has always been graded. From very early times there have existed the Elementary School, the Grammar or Secondary School for higher education, and the University. The so-called educational ladder has been preserved, but its top is no longer in the classical University for the learned professions only; it now reaches from the Primary School to industrial, technical and professional training for nearly all occupations.

At the present day the Scottish system aims at preparing the child both for individual effort and social duties. Its exponents claim that it provides for both of these and does not admit predominance or exclusive right to either. It regards them as complementary in a life that is neither egoism extended nor pure altruism.

ENLARGEMENT OF AREAS.

There is some agitation at present in the direction of extending the area of each School Board. Those who favor this claim that the nation should aim at being educated as a whole, and not at being an aggregation of more or less educated parishes. Poor parishes have difficulty in meeting the cost of elementary education, to say nothing of being able to provide education of a secondary character. On this ground there is urged a strong claim for the relief of the ratepayer from the school rate. Another argument, in favor of this enlargement of the administrative areas, is that thereby it is probable that the best men would be more surely induced to come forward and act on the School Boards. There is the usual reluctance of the more capable men to come into official life unless the part they are called upon and have opportunity to play is itself important and relatively large.

THE ROUTE OF EVOLUTION.

Prior to the Reformation the large number of schools attached to the Monasteries and Houses of the various Religious Orders was supplemented by a general system of parochial schools. With the Reformation a renewed impetus was given. John Knox in his 'First Book of Discipline' formulated a system of education by which a liberal scheme of instruction was to be provided in every parish at public expense. This scheme formed the basis of various Acts, the most notable of which was the 'Act for Settling of Schools,' passed by the Scots Parliament in 1696. This Act made general the establishment of a school and the appointment of a schoolmaster in every parish. The landowners of the parish were required to provide the school and to contribute to the salary of the teacher, and in the towns and cities the magistrates had the management and patronage of the schools. Side by side with the accommodation thus supplied there continued the schools of the churches and other voluntary agencies. This composite system persisted till 1833, in which year education grants voted by Parliament first became available for public education. It

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may therefore be said that the system originated as a local organization, and that not till a comparatively recent date did it receive the central support and control, which in new countries mark the beginning of an educational system.

CREATION OF SCHOOL BOARDS.

In 1872 the importance of local activity and local support was again formally recognized. In that year the great Education Act for Scotland was passed, by which local education authorities were created and power to levy a rate for the support of the schools was given. In every parish and burgh a School Board was formed, and to these Boards were transferred most of the existing schools. The revenue out of which the schools were supported came from (1) grants from Parliament, (2) fees and endowments, (3) local rates. Complete management was vested in the School Boards subject to the control of the central Education Department. A certain number of Church Schools, mainly those of the Roman Catholic and Episcopal Churches, remained outside this public system, but continued to receive grants from the Central Authority (now the Scotch Education Department).

Since 1872 various Acts of Parliament have extended the scope of the Education Authority, and enlarged the conception of general education. The most important is the Act of 1908, under which provision is made for medical inspection, feeding and clothing of necessitous children, establishment of employment bureaux, and expansion of the system of Secondary and Continuation Class education.

SECTION 2: SCOPE OF THE SYSTEM.

The system here outlined is in essence that which exists today. There are 970 School Boards which manage 2979 public schools and employ 16,678 teachers of various grades; also 352 so-called 'Voluntary' Schools (9 Church of Scotland, 1 United Free Church, 57 Episcopal Church, 220 Roman Catholic Church, 65 Undenominational), with 2,383 teachers. In all about 825,000 children are dealt with. The teachers in the public schools are appointed on professional qualifications only, and without any denominational test; in the voluntary schools they generally conform to the denomination concerned.

There is annually expended on this composite system about £2,560,000; of this, £17,000 is derived from endowments, £836,000 from rates, £49,000 from voluntary contributions, £44,000 from fees and books sold to children, £1,594,000 from Treasury grants, and £20,000 from other sources. Up to the age of 14, at which compulsory attendance ceases, education in the Board School is free.

Along with this must be taken into account the work of the Universities, dating from 1411.

OBLIGATIONS AND POWERS UNDER ACT OF 1908.

The most recent legislation—Education (Scotland) Act, 1908—conserves the main functions of the fundamental authorities for education in Scotland viz., the system of 'Parish Schools' and School Boards, so dear to the heart of Scottish parents, who have long been conspicuous for their jealous care of the educational interests of their children; consolidates the important developments of recent years; and provides a basis for further progress in response to new or newly-appreciated needs of the times. The Act assimilates the School Board franchise to that of the Parish Council and gives additional facilities for the combination of existing School Board districts into larger areas. Boards are now enabled to unite the whole or a portion of their territory with adjacent districts of another Board.

The Boards are empowered (1) to deal directly, instead of through Courts as formerly, with parents who prove neglectful in the matter of school attendance of their children, it being the duty of every parent to provide efficient education for his children who are between 5 and 14 years of age; (2) to institute prosecution of parents for lack of cleanliness, food or clothing of children, and where necessary to supply such lack out of school funds; (3) to ensure sufficient care of destitute and neglected or defective children by provision of food, clothing and lodging; (4) to regularize times of entering and leaving school by adopting 'fixed dates;' (5) to guide and advise young people as to their future careers in life, thus avoiding the easy temptation to casual labor; (6) to co-operate with employers in securing for future workers the best possible industrial training; (7) to require attendance up to 16 years of age at day school or continuation class, or partly at each, as a condition of granting school exemption certificates at the age of 12; (8) to prosecute parents and those who employ such young persons during hours required for such continued education under orders or by-laws of School Boards *re* continuation schools, the penalty on such employers, and on parents who conduce to such offences, being up to \$5 for the first and \$25 for subsequent offence; (9) to provide out of school funds for meals at cost, lodging of pupils near school, conveying them to school, or paying the travelling expenses of teachers or pupils to or from their homes in out-lying parts. The School Boards deal also with the following matters: care of defectives in special schools; compulsory attendance extending to 16; supplying school books and stationery to pupils; employing medical officers and nurses and providing appliances for medical examination and supervision of pupils; maintaining or combining with other bodies to maintain any agency for collecting and distributing information as to employments open to children on leaving school.

EFFECT OF ACT OF 1908.

The scope of the new Act is well summarized in a circular from the Department showing its general effect in extending the influences and enhancing the interest attaching to the work of School Boards:

Heretofore that influence and interest have been largely restricted to dealing with children under 14. They will be so no longer. In many respects the three or four years that immediately follow the period of compulsory attendance are the most critical in a pupil's life, and for the

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proper use of these a more clearly defined responsibility will henceforth rest upon School Boards. In future the individual citizens who undertake this responsibility will find ampler scope for the exercise of their administrative talents. The development of secondary and technical education under a more elastic system than has up till now been possible, the more perfect organization of continuation classes, the selection of young people who deserve to be guided and, where necessary, assisted by bursaries in their progress towards the universities or the central institutions for the teaching of science, of art, and of agriculture,—these are some of the duties that will lie to the hands of School Board members. Their successful discharge will call into play the highest qualities of skill and discretion.

BURGH AND COUNTY COMMITTEES.

These Committees on Secondary Education, established for certain areas under this Act, are composite bodies, consisting in the main of representatives of the various School Boards of the area, with additional members representative of the managers of the Intermediate and Secondary Schools of the district (whether School Board or voluntary schools) and of County and Burgh Councils. Even in the sphere of Primary Education these Committees are capable of discharging highly useful duties, for it is evident that certain educational services cannot always be properly or economically organized on the basis of individual School Board areas, such as provision for medical inspection of school children, supply of expert teachers of special subjects that lie outside the competence of the ordinary staff of a small school, etc. These Committees do not for the most part exercise any functions of direct management, and may best be regarded as organs of co-operative action on the part of School Boards.

PROVINCIAL COMMITTEES.

Still other educational services transcend the province even of Burgh or County Committees, such as the training of teachers for the service of the schools, not of any particular district, but of Scotland as a whole. This service till recent times was discharged almost exclusively by Church organizations. But in 1905 the Presbyterian Churches consented to transfer their functions and interests in the matter to Provincial Committees instituted in connection with each of the four Scottish Universities, and containing representatives of School Boards within a given "Province," as well as of the University of the "Province," and of other bodies interested in the training of teachers. After the constitution of the Burgh and County Committees, already referred to, the Provincial Committees were reconstituted on the basis of these Committees.

The Governors of the "Central Institutions" exercise functions analogous to those of the Provincial Committees, and like them contain for the most part representatives of the various Burgh and County Committees of their "Province."

NOMENCLATURE.

The educational system administered by these various bodies, so far as general education is concerned, uses a classification of schools based solely on distinction of curriculum. The term 'Elementary,' as defined in the English Education Act of 1870, is not strictly applicable to any class of school in Scotland.

The term 'Higher Grade' connotes a school receiving grants under the Code, and is therefore restricted in application. The term 'Higher Class' comes originally from the Education Act of 1872, and is mainly of historical interest, having no necessary relation to the character of the work done in the schools so designated.

The nomenclature used is the following:—

Primary School.—A school, or a department of a school, giving an education based upon English to pupils who are, as a rule, below the age of 14. A Primary School may contain individual pupils, or small sections of scholars, who are being instructed on the lines of an Intermediate School.

Intermediate School.—A school providing at least a three years' course of instruction in Languages, Mathematics, Science, and such other subjects as may from time to time be deemed suitable for pupils who, on entering, have reached the stage of attainment in elementary subjects indicated in Article 29 I. of the Code.

Secondary School.—A school providing at least a five years' course of instruction beyond the Qualifying stage (Article 29 I. of the Code).

FUNCTIONS OF VARIOUS SCHOOLS.

An Intermediate School corresponds generally to a Higher Grade School, but there are some Higher Class Schools which may fall into this category.

A Secondary School corresponds generally to a Higher Class School, but there are some Higher Grade schools which have developed, or in suitable circumstances may be expected to develop, a complete Secondary School course.

An Intermediate School should retain its pupils until at least the age of 15-16, and the normal attainments of the pupils at that age should be those indicated by the Intermediate Certificate.

A Secondary School should retain its pupils till at least the age of 17-18, and no pupil who has not qualified for the award of some form of Leaving Certificate, or for one of the alternative technical or commercial certificates, can be held to have completed the course satisfactorily.

Though the education of the Intermediate School is of the nature of Secondary (as distinguished from Primary) Education, the choice of subjects and the relative importance to be given to them at various stages of the curriculum may properly vary within certain limits, according as the school is one providing a three years' or five years' course. The curriculum of each type of school should be so arranged as to present, at the age at which pupils normally leave, a certain unity and completeness.

On the other hand, it is important that as between the Secondary School and the various Intermediate Schools of the same district there should be no unnecessary divergence of curriculum in the earlier stages, so that transference from the one to the other may not be impeded.

SPECIALIZED EDUCATION OF ADOLESCENTS.

This system of general education is supplemented by provision for the specialized education of adolescents and adults under the regulations of the Continuation Class Code, culminating in the work of the specially selected Central Institutions (Technical Colleges, Agricultural Colleges, Schools of Art,

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etc.) whose function is to focus the work of the Continuation Classes and to provide the highest possible instruction in the arts and sciences underlying the practice of skilled occupations.

The successful working of this system postulates arrangements for securing a supply of well-educated and thoroughly trained teachers, adequate to the needs of the schools—in itself a task of no inconsiderable magnitude.

SECTION 3: PRIMARY EDUCATION.

The most important function of School Boards is still that of providing (along with the managers of voluntary schools) for the primary education of children between 5 and 14 years of age. To this end the labours of hosts of teachers are directed, and for this purpose by far the larger portion of the growing expenditure upon education is incurred. The prevailing conceptions as to the scope and purpose of Primary Education have undergone considerable modifications in recent years, very largely as a result of the gradual raising of the school age. At no time has Primary Education been regarded in Scotland as simply a matter of instruction in Reading, Writing, and Arithmetic, and at the present time less than ever is it so regarded. The problem is how to use the various subjects of instruction so as to develop all the faculties of the child, to elicit his sympathies, regenerate his impulses, cultivate his faculty of observation, exercise his intelligence, and improve his powers of expression. This is a high and difficult art, demanding for its exercise thoughtful, devoted and well-trained teachers. Provided the art be skilfully exercised, proficiency in Reading, Writing, and Arithmetic will be secured as a matter of course, as an incidental result, within the usual limits of school life in the case of normal children. But to aim at this incidental result principally or directly may well be to stultify the whole educational process without securing more than an evanescent, because mechanical, proficiency in the subjects on which instruction has been concentrated.

Still, for practical purposes, Reading, Writing, and Arithmetic may be taken to be the main subjects of instruction in the Primary School curriculum. All the others are to be regarded as auxiliary—valuable for the discipline they afford and the variety of means they offer for exercising the intelligence of the children, rather than for the amount of positive knowledge or of proficiency acquired, even though that may be considerable.

The auxiliary subjects are:—Nature Knowledge, Geography, History, Physical Exercises, Singing, Drawing, and (for girls) Sewing. The three first-named may and ought to be made to subserve in large degree the purposes of the main instruction in English and Arithmetic, and instruction in the former class of subjects need in no way interfere with the attainment of due proficiency in the latter. Drawing, if properly taught, is a valuable instrument for Nature Study, and may indeed be reckoned as part of the same subject. Other subjects, *e.g.*, Physical Exercises and Singing, while less intimately allied with the main instruction, are essential concomitants of it, while Sewing is an art in which some degree of expertness must be acquired during school life if it is to be acquired at all.

SUPPLEMENTARY COURSES.

A notable educational development of recent years has been the attempt to add reality to the work of the Primary School in its later stages by setting aside some time for the consideration of what has been already learned in its practical bearing on the probable future occupation of the pupil and the employment of his leisure time. That is the special function of the 'Supplementary Courses' to which it is desirable that one or, if possible, two years should be given before the close of the period of general education.

The Supplementary Course is a Scotch institution with a close resemblance to the *cours complementaires* in France. It prepares directly for industrial training. It is the most advanced work of the Primary School, and is designed for pupils who leave school at 14. Under the Act of 1908 the School Board may fix dates for children entering and leaving school, these being chosen with the approval of the Central Authority, viz., the 1st of August, February or April next after the child's 5th birthday for entering; and corresponding ones at the age of 14 for leaving.

From the time of entering to about 7 years of age, the child remains in the Infant Department; then from 7 to 12 there are five main stages. At 12 he passes the qualifying examination and goes to either Supplementary Course or Secondary work.

There is no distinction between Elementary and Secondary work before 12 years of age. The 6th and 7th year course is the same in all types of school, the idea being that if you are going to build higher, you will have a better foundation all along. The bulk of opinion is in favor of deferring specialized instruction till after 12.

SELECTION OF COURSE.

At the age of 12 a notice is sent to parents asking them what course they desire the child to follow. If a child is to leave at 14 it is better for him to take the Supplementary Course, then his artisan or commercial training in the evening schools, at which the Board has power to keep him till 17. The integral difference between these two plans is that in the Supplementary Courses no new ground is broken; what training is given is through English literature, and the pupils' work is consolidated; e.g., arithmetic is technical—'graphs' and the like. Generally speaking half the time is given to manual work; the boys have 5 hours drawing and manual instruction and the girls have full housekeeping, including household arithmetic and account-keeping. They go out in turn to buy provisions to be cooked as the day's work, and they also have dressmaking and other things.

If a boy had taken the Supplementary Course and then changed his mind, he would really require to go back to the beginning of the Higher Grade course, and though he might then go a little faster he would be handicapped almost to the extent of the time he had spent. He would not lose much, however, in his powers of observation and reasoning. On the science side the work in the Continuation

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Classes follows that of the Supplementary Course. After two years of the latter and two years of evening technical work a lad would be as well equipped for the particular kind of artisan work to which he was going as if he had had the three years' science course of the Intermediate School.

TO SERVE THE LARGEST NUMBER.

The Supplementary Course meets the needs of the many. As a matter of fact there are only very few cases of boys changing from one course to the other, chiefly because the schools are very fortunate in having the right men to advise the parents, so that only those who are quite sure of not being able to keep the boy at school after 14 send them into the Supplementary Classes. Out of about 7,000 going out yearly in Glasgow probably 2,000 have not reached the Supplementary stage, but the by-law passed under the Education Act requires that they shall make it up before 16. The difficulty is that where boys are working in factories and shops, the number of hours, including education, must not exceed the limit stated in the Factory Act. Hence some employers are rather inclined to say that if there is any restriction as to hours of labour they will take nobody before 17. Others pay their apprentices sixpence a week additional for each certificate they get, so that some of these boys earn fourteen shillings who would ordinarily be getting only ten. One of the main objects of the by-law is to improve the attendance at day school, and in time it is expected that those who do not attend will be so much handicapped in getting employment that the effort will be made to keep them at school till 14. Only those who do not attain a certain standard come under the by-law, and the parents begin to appreciate it already.

Pupils who have satisfactorily completed the course of the Primary School, including attendance for at least one year at an approved Supplementary Course, are granted the 'Certificate of Merit'.

While there is no doubt that in many of the Supplementary Courses good work is being done, there is still need of improvement, specially in the direction of the future work of the pupil in Continuation Classes. At present too many come forward to Evening Classes with little of the special training that the Supplementary Courses are designed to secure.

In the Supplementary Classes pupils receive special instruction in that which precedes the trade they have to learn. If the boy is to follow any given line of work he gets practical training in the use of good tools. If he is going into ironworking he does not learn in the Supplementary Classes to become a mechanic, but he gets training in the use of ironworking tools, and is given experience in order that he may know the meaning of materials, tools, plans and drawings.

During the year 1910, 60,683 candidates were approved by the Inspectors for enrolment in Supplementary Courses or Higher Grade Departments.

Some idea of the progress in advanced work in the Primary Schools during recent years may be gathered from the fact that whereas in 1900 the number of these schools was only 162, with an average attendance of 3,282, in the next ten years the number of schools increased to 1,945 with average attendance 43,287.

DEPARTMENT'S SUGGESTIONS FOR SUPPLEMENTARY COURSES.

The supplementary instruction is to a certain extent specialized, and the Scotch Education Department indicates the nature of the specialization in some Specimen Supplementary Courses. It is expressly stated that these courses are mainly suggestive and cannot as a rule be satisfactorily overtaken in their whole extent by pupils who leave at 14; it is expected, however, that they will be carried out in such a way that the pupil can continue them without any essential change of method in the more advanced Continuation Classes.

The following are the differentiated lines of work suggested:—

Preparation for commercial pursuits. (Commercial Course.)

Preparation for manual occupations and trades. (Industrial Course.)

Preparation for rural life. (Course for Rural Schools.)

For girls—Preparation for domestic duties. (Household Management Course.)

Navigation is also suggested for Seaboard Schools.

THEIR MAIN OBJECTS.

But school work, says the Department, has for its end and aim objects more important than preparation in the narrow sense for any particular occupation. It should aim at producing the useful citizen, imbued with a sense of responsibility and of obligation towards the society in which he lives. It should render him—so far as the school can do so—fit in body and alert in mind, and should prepare him for the rational enjoyment of his leisure time, as well as fit him for earning his living. These are ideals, no doubt; but they are ideals towards which the school should constantly strive. It follows that instruction in certain matters of general import should in all cases be combined with, and should even take precedence of, the instruction special to each of the courses of the preceding paragraph.

With regard to the special instruction to be given in the several Supplementary Courses, it is not intended that such instruction should attempt to take the place of that kind of knowledge which can only come from the daily practice of some particular occupation. But this instruction, rightly given, should make that practice more intelligent, and should remove certain difficulties from the way of the learner. It should be sufficiently general in scope to make it profitable even for those who for one reason or another will not follow in after life the particular group of occupations which has been kept mainly in view.

DEVELOPING SELF RELIANCE.

The Department recognises that great differences will exist, particularly between town and country schools, as regards facilities for the formation of such courses. In considering the problem, the position of the small rural school taught by one teacher has been kept in mind. In such circumstances class teaching of

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the small number of pupils who have reached the Merit Certificate stage is clearly out of the question. The Department does not regard this as being, in certain respects, any real disadvantage. It has been frequently noted as one of the defects of the large town school, with its minute sub-division of classes, that the pupil is left little leisure to think for himself, and that the habit of depending upon the instructions and explanations of the ever-present teacher is apt to become ingrained. Whereas, in the opinion of not a few experienced observers, the country lad, as compared with his contemporary in a town school, shows towards the close of his school career greater intellectual resources. This is due not so much to inherent mental ability or to any superiority in the teaching, as to the fact that the aid of the teacher not being always available, he has been forced by circumstances to think for himself. It is clearly desirable, in the case of a pupil who is to be more or less his own master at 14, that there should be in school a period of preparation for this state of semi-independence, during which transition period he shall be regarded not as a pupil of a class, but as a student studying, under direction, certain subjects for ends which he himself in some degree realises and desires.

Not merely should self-reliance in study be fostered, but a sense of responsibility should be inculcated, by giving the pupil at this stage some authority as regards conduct in the playground, and the minor matters of discipline, as well as a position of honor in exercises common to the school, such as drill. The boy at this stage tends to acquire a sort of authority among his school-mates, and it is most important that this natural influence should be enlisted on the side of law and order, rather than that it should be driven, as it easily may be, into opposition. There seems to be no reason why it should not be turned to account in Primary Schools, as it frequently is in Secondary Schools, as an instrument in the development of character, and in the fostering of a healthy school spirit.

INDIVIDUAL STUDY DIRECTED TO PRACTICAL ENDS.

Whether in town or in country, whatever the opportunities for collective instruction may be, the Department desires that the distinguishing note of the work of the pupils in the Supplementary Courses should be individual study directed to practical ends. The object should be, not so much to impart information to the pupil, as to exercise him in obtaining for himself from sources within his reach, and setting out, in an orderly manner, all necessary facts relative to a given topic.

Great use may be made of the daily newspaper as a starting-point of such investigations. For instance, having made an analysis of the shipping returns for a given port the pupil may ascertain the general character of its trade; look up in an atlas the various places mentioned in the shipping list; make note of their relative position and distance; gather from school geography, gazetteer, or encyclopædia certain information as to the more important of them; and finally set forth in well digested and orderly form the information obtained. He may proceed to make a similar investigation for another port, and institute

a comparison; or he may be referred to the sources of accurate information as to the total exports and imports of a place and be asked to make an analysis of these over a series of years. Similarly, historical allusions in the leading article or elsewhere in the newspaper may be made the occasion for reference to such sources of information as are to be found in the school library, and for a certain amount of collateral reading of authorities, the results of which should be embodied in *precis* form. All this is not matter for formal and regularly recurring lessons in geography or history, but for individual investigation extending over, it may be, several days. The newspaper will also be useful in other ways. Its various articles will afford material for exercise in *precis* writing; difficulties of vocabulary will give occasion for frequent and useful reference to the dictionary; above all, perhaps, the market reports will furnish a body of material for exercises in calculation much superior to the cut and dried examples designed to illustrate the rules of a text-book, while their perusal may be made the occasion of acquiring much incidental information of practical value.

By means such as these a sense of actuality may be given to the work and a spirit of initiative cultivated in the pupils. The examples given are not intended as directions to be implicitly followed; it is much more important that individual teachers should exercise their ingenuity in devising for themselves the best means they can for achieving the essential objects aimed at.

SECTION 4: INTERMEDIATE AND SECONDARY EDUCATION.

The immense impulse which the passing of the Act of 1872 gave to Primary Education made its effects felt within a very few years upon Intermediate and Secondary Education also. In course of time the original provision for higher education was supplemented by the development in connection with favourably situated Primary Schools, of secondary departments which have become the Higher Grade Schools of to-day. While a large proportion of these are satisfied with providing a broad basis of general education on Secondary School lines for pupils who are to leave school about the age of 16, a small number are staffed and equipped upon a scale which enables them to give a complete Secondary Education parallel to that offered by the older endowed schools and Higher Class Public Schools. As a consequence it is now possible to consider the supply of centres of higher education as reasonably complete.

SECTION 5: CONTINUATION CLASSES.

DUTIES AND POWERS OF SCHOOL BOARDS.

Remarkable activity has been shown in the endeavor to discharge the new duties placed upon School Boards by section 10 (1) of the Act of 1908 as regards the establishment of classes for further instruction of young persons who have left school, with a view to their future usefulness as workmen and citizens. The

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number of centres for Continuation Class instruction is now over 1100. Sec. 10 is as follows:—

10.— (1) Without prejudice to any other power of a school board to provide instruction in continuation classes, it shall be the duty of a school board to make suitable provision of continuation classes for the further instruction of young persons above the age of 14 years with reference to the crafts and industries practised in the district (including agriculture if so practised and the domestic arts), or to such other crafts and industries as the school board, with the consent of the Department, may select, and also for their instruction in the English language and literature and in Gaelic-speaking districts, if the school board so resolve, in the Gaelic language and literature. It shall also be their duty to make provision for their instruction in the laws of health and to afford opportunity for suitable physical training.

(2) If it is represented to the Department on the petition of not less than ten ratepayers of the district that a school board are persistently failing in their duty under the foregoing subsection, the Department shall cause inquiry to be made and may call upon the board to institute such continuation classes as appear to the Department to be expedient, and, failing compliance, may withhold or reduce any of the grants in use to be made to the board.

(3) It shall be lawful for a school board from time to time to make, vary, and revoke by-laws for requiring the attendance at continuation classes, until such age not exceeding seventeen years as may be specified in the by-laws, of young persons above the age of 14 years within their district who are not otherwise receiving a suitable education, or are not specially exempted by the school board from the operation of the by-laws; and that at such times and for such periods as may in such by-laws be specified. Such by-laws may also require all persons within the district having in regular employment any young person to whom such by-laws apply to notify the same to the board at times specified in the by-laws, with particulars as to the hours during which the young person is employed by them:

Provided that no young person shall be required to attend a continuation class held beyond two miles measured along the nearest road from the residence of such young person.

(4) Sections 185, 186 and 187 of the Public Health (Scotland) Act, 1897, shall apply to by-laws made under this section as if they were herein re-enacted, with the substitution of the Department for the Board and of the school board for the local authority.

(5) If any person fails to notify the school board in terms of any such by-law in regard to young persons employed by him, or knowingly employs a young person at any time when his attendance is by any such by-law required at a continuation class, or for a number of hours which, when added to the time required under any such by-law to be spent at a continuation class, causes the hours of employment and the time so spent, taken together, to exceed in any day or week, as the case may be, the period of employment permitted for such young person by any Act of Parliament, he shall be liable on summary conviction to a penalty not exceeding 20 shillings, or in case of a second or subsequent offence, whether relating to the same or to another young person, not exceeding 5 pounds.

(6) If any parent of a young person by wilful default, or by habitually neglecting to exercise due care, has conducted to the commission of an offence under the immediate preceding subsection, or otherwise to failure on the part of the young person to attend a continuation class as required in any such by-law, he shall be liable on summary conviction to the like penalties as aforesaid.

ADVANCED WORK BY COUNTY COMMITTEES.

A small number of County Committees have taken active steps towards the organization of technical instruction within their area, including the preliminary step of appointing a special organizer. In this connection the systematic scheme of the Renfrew County Committee is cited as worthy of imitation. The scheme aims at a concentration of advanced work at certain central points, these centres being in turn affiliated with the Central Institutions. It comprises one feature of unusual interest, the first of its kind, a graded Rural Course extending over three years, and leading on to a study of Agriculture and Agricultural Science. All the way through the instruction is given a 'rural' bias, so that the country student feels himself specially provided for as much as the town artizan is in an industrial course.

For further particulars of the work of County Committees, including plan of co-operation between the Fife Committee and the School Boards, see Chapter XVI on organization in County of Fife.

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PROGRESS IN CONTINUATION CLASS WORK.

The stimulus given to the institution of Continuation Classes by the Act of 1908 was demonstrated during the year 1910. Probably the change of procedure by which Continuation Class authorities were requested to submit to the Department a definite programme of work, some distance in advance of the opening of the session instead of after the session had started, had something to do with this. The change has been found profitable in several ways. (1) It helps to make the Continuation Class question a live one the whole year round, managers requiring early in the summer to prepare their plans for the autumn. (2) It calls upon managers themselves to determine their coming programme—after a careful survey of the needs of their area—rather than to leave the programme to be decided by the demands of intending pupils on enrolment night. (3) It gives time for the discussion of subjects of general application, *e.g.*, organization, affiliation, etc., before the detailed proposals come up for examination.

The completed statistics for 1909-10 reveal the fact that 127,687 individual students were included for grant, as against 108,813 in the session 1908-9. Comparing these figures with 78,171 in 1901-2 (the first year of the operation of the Continuation Class Code) it is evident that a substantial increase in the provision for after-school instruction has been attained, and there is reason to hope that the steady progress shown will be well sustained.

In 1910-11, 593 local authorities successfully conducted Continuation Classes, as compared with 550 in 1909-10. The premature closing and abandonment of some 150 centres (mostly in rural districts), conducted by 65 School Boards, resulted in only 1,121 centres coming to fruition, as compared with 1,055 in 1909-10. Continuation Classes all over the country are urgently in need of assistance by way of loan of specialist teachers. Often Boards are unable to include in the curriculum provided for young people the more attractive subjects of instruction, *e.g.*, Cookery, Woodwork, Physical Exercises, etc., because no teacher is available. When a regular rota of such teachers is forthcoming, it may be possible to hold together more securely many rural classes which now lead a precarious existence.

TEACHERS FOR CONTINUATION CLASSES.

In the expectation of a much more widespread provision of Continuation Classes than exists at present, and in view of the prime importance of having these classes in all cases taught by fully qualified specialist teachers, rather than by members of the day school staff who may possess only a limited qualification in the subject, County committees are urged to take up on their own initiative the question of the appointment of a staff of such specialist teachers for Continuation Class work, particularly in agricultural districts, whose services would be lent out to various Boards on condition of a contribution proportionate to the service rendered in each case.

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COMPULSORY ATTENDANCE AT CONTINUATION CLASSES.

There is evidence that this subject is engaging the attention of a rapidly increasing number of School Boards throughout the country. It is very satisfactory to note that no objections were lodged with the Department to compulsory by-laws passed by Boards, and that they appear to have worked smoothly. In some cases the application of the by-laws is restricted to persons under 16 who have failed to pass the qualifying examination—a very modest requirement indeed but one which yet makes a useful beginning. In other cases it is found that the clause requiring attendance at Continuation Classes, up to the age of 17 years, extends to young persons who have failed to reach the standard of education implied by two years' attendance at a Supplementary or Intermediate Course. In all cases a clause is inserted to permit of the School Board granting exemption from the operations of the by-laws in any particular case—an indispensable condition and one which should provide sufficient security against any cases of individual hardship which may arise.

SECTION 6: DEPARTMENTAL SUGGESTIONS TO SCHOOL BOARDS.

The Scotch Education Department issued a circular (426) on 27th August, 1909, in connection with the foregoing important matters, directing the special attention of all School Boards to the new and exceedingly important duties placed upon them by section 10 of the Act of 1908, and requesting their careful consideration in connection with all proposals for the forthcoming session of Continuation Class work.

The Department sets out by stating that a certain amount of moral training had been given and a certain modicum of instruction in Reading, Writing and Arithmetic (and incidentally in other subjects) imparted in the hope, apparently, that the education so given would be of material assistance to the child in its future occupation, whatever that might be, and that he or his parents might be trusted to turn it to good account. Up to the passage of the Act of 1908, however, it had been no part of the statutory duty of a School Board or other public body to take cognizance of the period of adolescence and re-enforce parental control when most needed, but actually weakened from natural causes; to guide, inform and advise young persons as to choice of occupation; to ascertain what further systematic instruction was needed to increase their efficiency in occupations and make them more useful citizens; or to see to the actual provision of suitable means of further education. Though sporadic, and in large measure unsystematic, efforts have been made by many School Boards to provide such instruction, generally speaking they had felt no responsibility for providing education for young persons over 14.

EXTENT OF CONTINUATION CLASS WORK.

Experience in other countries as well as Scotland shows that instruction and control and discipline of adolescents is a matter of State concern, and it

is a tribute to the soundness and efficiency of Scottish educational traditions that the momentous experiment in this direction is to be made first of all in Scotland. The legislation has indicated generally certain lines which this further education should follow:—(1) The maintenance and improvement of the health and physique of young people; (2) the broadening and refining of their interests and sympathies by the influence of good literature; (3) equipping them with a competent knowledge of some craft, industry or occupation which offers a reasonable chance of providing a means of livelihood in their adult years; (4) the inculcation of the responsibilities and duties, as well as rights and privileges, of communal life.

IMPROVEMENT TO COME GRADUALLY.

The task now imposed upon the educational authorities of the country will require the whole-hearted efforts of a generation not less active in educational endeavor than that which has brought the working of the present Education Acts to something like fruition.

The first step is to ensure that all School Boards shall provide, in rudimentary form, at least, some part of that instruction called for by the Continuation Class Code. That part which bears upon industrial training will require the services of teachers specially qualified; but as a beginning, School Boards should provide for young persons who have left school the form of instruction prescribed for Supplementary Courses of the day school. Such instruction must be rearranged and to some extent broken up to meet the conditions of Continuation Class work, but every School Board in the country may reasonably be expected to provide this instruction with their existing staff, though many have hitherto not attempted to do so, although the Government grant under the Continuation Class Code enables managers to recover three-fourths of their outlay upon maintenance.

SUPPLEMENTARY COURSES PREPARE FOR CONTINUATION CLASSES.

The foundations of all Continuation Class instruction should be laid in the Supplementary Courses of the day school, and some course of the kind outlined in the Code should be placed within reach of every day school pupil between 12 and 14, either in his own or a neighbouring school. Much greater attention than at present should be given to the development of the practical work prescribed, much greater pains taken to adapt the instruction to the probable future occupations of the pupils, and vigorous efforts made to ensure that a much smaller proportion of pupils leave the day school without something approaching to two years' experience in Supplementary Course work. This of itself will probably imply in very many cases some overhauling of Elementary Class curricula and systematic enforcement of regular school attendance at an earlier age than is at present customary.

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IMPORTANCE OF SUPPLEMENTARY COURSES.

The Qualifying Examination is, of course, the passport, not merely to Intermediate and Secondary Schools, but also to Supplementary Courses. The importance of the latter has not yet been fully realized by all managers, and still less by all parents. Consequently, of the 60,683 scholars who successfully passed the Qualifying stage (together with 2,141 who were accepted as showing equivalent attainments) during 1910, a considerable number drifted into the first year of the Intermediate Course without having any genuine intention of remaining to the end. Steps are being taken, both by local managers and by the Department, to try and cope with this undoubted waste by diverting the stream into its proper channel—an end which will never be satisfactorily attained until Supplementary Courses are placed in a position of equal dignity with the earlier years of the Intermediate Curriculum. In the circumstances, it would not be fair to draw any deductions from a comparison between the large number who enrol as Intermediate scholars and the comparatively small proportion who complete the course creditably. Looked at by itself, indeed, the number of those who gain the Intermediate Certificate is far from being unsatisfactory. Last year the total was 4,093. In 1910 as many as 1,088 Leaving Certificates were gained—a figure considerably in advance of anything that had previously been reached.

OBJECT OF SUPPLEMENTARY COURSES.

The duty of a School Board under the Act of 1908 is not merely to provide necessary opportunities for making good the defects of previous education, but to take steps to ensure that all young people of their district shall have received that general preparation for the duties of life which it is the object of the Supplementary Course to supply. This object will be attained most completely and economically, especially in the rural districts, by encouraging, if not requiring, a certain limited attendance during the winter months at ordinary Supplementary Classes of pupils over 14 who have not already completed 2 years' attendance at such courses.

The essential idea of Supplementary Course work is that of individual study under direction rather than that of class instruction. These older pupils should have individual lines of study marked out for them, to be followed up very largely at home, the teacher being called on for explanation of difficulties and review of work done, as was the custom in olden days in the rural schools of Scotland. These centres of instruction will be visited at regular intervals by specialist teachers competent to advise and direct students in subjects requiring expert knowledge or skill beyond the resources of the ordinary school staff.

DEVELOPING PUBLIC OPINION.

In more populous districts, particularly in industrial centres, the equivalent of Supplementary Course instruction will probably be provided more conveniently in classes distinct from those of the day school. The disadvantages attaching

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to Evening Class instruction are so grave in some cases as to make it doubtful whether they do not outweigh the advantages. It is hoped that School Boards in such districts will make a strong effort, by conferences with employers and otherwise, to cause public opinion to regard attendance at suitable Continuation Classes as part of that instruction in trade or industry which an employer is supposed to provide for employees in trades where there is a regular system of apprenticeship, and therefore as nominally falling within the regular hours of employment.

CO-OPERATION OF EMPLOYERS AND EMPLOYED.

It is even more important to create among employers in those industries in which there is no semblance of an apprenticeship, and in which the labor of adolescents is too often no preparation for independent livelihood in adult life, a sense of responsibility for the future of young persons in their employment.

It is obvious that bylaws passed by School Boards under the Act of 1908 requiring attendance of young persons under 17 at Continuation Classes, (the times of such attendance to be deducted from the maximum number of hours of daily or weekly employment, as prescribed for any industry by Act of Parliament) must be largely inoperative unless supported by public opinion. School Boards in industrial districts have no more important or pressing task than the fostering of a movement for the better use of the years of adolescence as a preparation for adult life. To accomplish this, School Boards must associate with themselves representatives of employers and employed, and must join hands with every agency for industrial efficiency and social welfare. They must also adapt their classes to the exigencies of particular employments, both as to periods and nature of instruction.

VOLUNTARY OR COMPULSORY ATTENDANCE.

The Department proceeds to ask whether it is possible on a basis of voluntary attendance to reach the class of young persons who have little instinct for self-improvement and are least willing to exchange the freedom of the streets for the discipline and comparative restraint of even the most attractive Continuation Classes. They also question whether there may not be an even larger class who will accept a certain measure of compulsion without demur and profit by or even enjoy attendance at Continuation Classes when attendance is required of them, who, if left to themselves, lack sufficient energy or resolution to resist other attractions. Lastly they ask whether it is possible on any system, whether voluntary or compulsory, to rescue youths from "blind-alley" occupations and give them a training which will afford better chance of regular employment in adult life, unless the hours of casual labour are restricted and regulated so as to admit of the necessary teaching being given.

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ANALYSIS OF OCCUPATIONS.

For the proper consideration of these questions, the first requisite would seem to be the annual compilation of a register of young persons between 14 and (say) 18 not attending schools, with an analysis of occupations followed by them. Each group of occupations followed must be closely studied to discover the sort of instruction most suitable to those engaged in it, not merely for present efficiency, but for future power. It is important also to consider the times at which and the manner in which instruction may best be given, having regard to the exigencies of the particular employment.

By such a system of Continuation Class instruction, resort to compulsion may be rendered unnecessary, and if not, a School Board which has exhausted all efforts at organization on a voluntary basis will be able to appeal with greater confidence for the power of compulsion which the law now allows. When compulsion is resorted to, it should be limited in the first instance to those who have not received the minimum of supplementary instruction before leaving the day school.

The register referred to would be valuable in ascertaining the extent to which young persons are profiting by present educational opportunities, and also in making out another section—that relating to the maintenance of Employment Bureaux.

It is urged that all Continuation Class instruction should be intensely practical, in the sense that it must be regulated by the purposed future of the pupil, as it is obvious that a wise choice of that future by individuals is of vital interest to the whole community. Further that arrangements should always be made for the instruction of students in English, in the laws of health and duties of citizenship, and opportunity should also be offered for suitable physical exercises.

TEACHERS SHOULD KNOW OCCUPATIONS OF PUPILS.

Thorough knowledge on the part of School Boards of the occupations actually entered upon by young people when they pass from the Day School is not only an essential pre-requisite of any sound system of Continuation Class organization, but is needed by teachers as a directing influence in ordering the work of Supplementary Courses for children who have not yet left school. Teachers in charge of these courses exercise an important if not determining influence upon the choice of occupations by their pupils, and it is essential that in this work they should have the assistance and support of a properly constituted agency established for the purpose of aiding children leaving school in their choice of future employment, such as the Act of 1908 empowered every Board to establish.

RURAL EDUCATION.

Schemes for development of work of the Agricultural Colleges in rural districts are progressing satisfactorily, their main objects being to place at the disposal of the farming community the benefits of experience and research of College Staffs,

and to link up with the College organization the agricultural and horticultural work done in various schools and classes in the College districts. These ends are being attained chiefly by the appointment of (a) a College organizer for each county or group of counties comprised in the College area; (b) additional dairy and poultry instructresses; and (c) in the case of the crofting districts comprised in the area of the Aberdeen College, special crofter instructors. These extension schemes have developed in considerable measure up to the date of this Report. The formation of local advisory committees to assist staffs of Colleges in organization of extension work has the hearty approbation of the Department.

SECTION 7: CENTRAL INSTITUTIONS.

The Central Institutions may be said to form the crown of the Continuation Class system. The following is a list of such Institutions at work in 1909-10:—

Aberdeen and North of Scotland College of Agriculture.

Aberdeen, Robert Gordon's Technical College.

Dundee Technical College and School of Art.

Dunfermline College of Hygiene and Physical Training.

Edinburgh and East of Scotland College of Agriculture.

Edinburgh College of Art.

Edinburgh, Heriot-Watt College.

Edinburgh, Royal (Dick) Veterinary College.

Edinburgh School of Cookery and Domestic Economy.

Glasgow and West of Scotland College of Domestic Science.

Glasgow and West of Scotland Technical College.

Glasgow Athenæum Commercial College.

Glasgow School of Art.

Glasgow Veterinary College.

The West of Scotland Agricultural College.

Leith Nautical College.

These Institutions continue to grow steadily in importance and usefulness. The normal goal of students entering the Institutions is the diploma awarded on the completion of a four years' course by a committee of assessors, including a person of eminence in the profession to which the particular diploma course has relation. By means of co-operation between the Central Institutions and School Boards the work performed in courses under Division III. of the Continuation Class Code is linked up with the higher work in the Central Institutions, and steady progress in the perfection of this system of co-operation is being effected year by year.

INFLUENCE OF CENTRAL INSTITUTIONS.

Fortunately there are many districts in Scotland where the question is not how to meet a minimum requirement such as that of the Supplementary Course, but rather how to organize technical instruction relating to industries

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so as to provide in the completest way possible for the industrial requirements of the district. In some sections, recent progress in Continuation Class instruction has been very remarkable, both as regards numbers in attendance and in proportion of students who carry their studies to a really advanced stage. In such districts the Central Institutions have exercised a direct influence upon the whole, and gradually all purely elementary work has been eliminated from these institutions, which have been linked up with subsidiary centres throughout the whole district, the work at the latter being recognized as *pro tanto* equivalent to work done at the Central Institution.

Increasingly vigorous efforts have also been made to interest both employers and employed in the work, inducing the former to give all possible facilities and encouragement to employees to attend the classes. This process of co-ordination and affiliation is most advanced in classes for subjects which naturally connect themselves with the Technical Colleges, but in Industrial Art also the advance has been considerable.

Agricultural Colleges, though of more recent foundation, are rapidly occupying their special field of operation. For each County or group of Counties within the "Province" of the College a highly skilled instructor has been or will be appointed to give advanced instruction at suitable centres, whenever sufficiently qualified teachers can be found to exercise an influence upon School Gardening and Nature Study classes of the primary school, so as to make them an effective introduction to the special study of agriculture; and generally to act as agent of the College in bringing home to the farming community in every possible way the results of agricultural research and experience. It is hoped that a similar course may be followed in the case of the Central Schools of Cookery and Housekeeping, Colleges of Domestic Science, etc.

The total grants to Central Institutions from the Department for 1909-10 were (a) from Parliamentary Vote, £39,208 and (b) from Education (Scotland) Fund, £34,797. For 1909-10 the total maintenance expenditure of Central Institutions (including 5 recognized as such since passing of Act of 1908) was £123,321. This expenditure was met by (a) receipts from students' fees, (b) the Department's grants referred to above, and (c) contributions from local resources, including Endowments,

It is not considered necessary here to give extended or detailed information concerning the work of the several Central Institutions. General information, to the extent that may be useful in Canada, is given in the report on Edinburgh and Glasgow, in regard to some Central Institutions.

THE UNIVERSITY GRANTS.

A Parliamentary Grant of £42,000 is made annually to the four Scottish Universities. The expenditure out of these grants is not accounted for in detail to the Treasury, nor are unexpended balances surrendered at the close of the financial year. The grant is made under Section 25 of the Universities (Scotland) Act, 1889. In addition, the Universities receive £30,000 annually from the Local Taxation Account under Section 2, Subsection (2) of the Education

and Local Taxation Account (Scotland) Act, 1892. Thus a sum of £72,000 per annum is received by the Universities from Parliament and is administered by the University Courts in accordance with the ordinances of the Commissioners under the Universities Act, 1889.

The Scotch Education Department does not control these moneys in any way, but under Section 16 (1) (b) of the Education Act 1908, the Secretary for Scotland (the representative head of the Education Department) administers grants to the Universities from the Education (Scotland) Fund. (See above.)

The following table shows for 1908-9 the number of students and the allocation of the Parliamentary Grant of £72,000.

	<i>Grants.</i>	<i>Number of Students.</i>
Edinburgh.....	£25,920	3,286
Glasgow.....	20,880	2,699
Aberdeen.....	14,400	970
St. Andrew's.....	10,800	585
	<hr/> £72,000 <hr/>	<hr/> 7,540 <hr/>

SECTION 8: HOW EDUCATION IN SCOTLAND IS FINANCED.

SOURCES OF INCOME.

The money by which all these various educational institutions are financed may be said to come from four main sources, viz:—

- (1) Treasury Grants derived from taxation.
- (2) Receipts from local rates.
- (3) Endowments and receipts from investments of corporate bodies.
- (4) Fees of pupils or students.

The public at large provide (1) and (2), the former to the central government, the latter to the local rating body. No. 3 is derived from particular bodies or individuals who have felt the importance to the country of a proper provision of education. No. 4 is a receipt directly from the beneficiary and bearing an approximate relation to the amount of the benefit received.

The contribution of the public under the first head flows as part of general taxation to the Treasury. The amount required is voted annually by Parliament, or is allocated specifically under various Acts of Parliament. The details of distribution to the various managing bodies are, with the exception of the University grants and the grants to reformatory (industrial) schools, administered by the Scotch Education Department. Under the second head the School Boards levy (through the Parish Councils) local rates of various amounts according to the needs of the area controlled by the Board. The amount so raised is what is required in supplement of grants from the central body and other revenues, to meet the current expenditure of the year in question.

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(1.) CENTRAL FUNDS.

THE PARLIAMENTARY AND SCIENCE AND ART GRANTS.

There is voted annually by Parliament for Public Education in Scotland, including the Science and Art Grants, a sum which is administered by the Scotch Education Department. In 1909-10 the amount granted was £2,147,291.

This total may be subdivided as follows:—

1. Administration of the Central Offices of the Scotch Education Department and Audit of School Board Accounts.....	£	22,320
2. Inspection.....		41,482
3. Grants for elementary education.....		1,759,394
4. Grants for Continuation Classes, including Central Institutions and Secondary Education.....		166,500
5. Grants for Training of Teachers.....		142,392
6. Maintenance of the Royal Scottish Museum.....		15,203

It will be seen that, of the total, administration takes about 1 per cent, inspection about 2 per cent, elementary education 82 per cent, continuation classes and secondary education about 8 per cent, training of teachers about 7 per cent, and the Museum less than one per cent.

(A) THE EDUCATION (SCOTLAND) FUND.

This fund, constituted by the Education (Scotland) Act, 1908, amounting in the aggregate to about £500,000 a year, now "pooled" and distributed as per Act of 1908, consists of: (a) Residue Grant; (b) Grants-in-Relief of local taxation before the Act of 1908; and (c) similar moneys assigned by the Treasury to Scotland as a whole in consideration of corresponding demands which the sister countries made upon the National Exchequer.

The first charges upon this Fund are for such educational purposes as cannot be considered a proper charge upon the resources of any one district, *e.g.*

(1) Expenses of inspection and examination in connection with Secondary and Intermediate Schools, so far as unprovided from Parliamentary votes;

(2) Universities, if they can make out good cases for aid;

(3) Central Institutions (in respect of either capital or maintenance expenditure) when the benefits are spread over the country as a whole; including Technical Colleges, Colleges of Agriculture, Schools of Art, etc.;

(4) Maintenance of National Institutions and payments to Provincial Committees for the training of teachers;

(5) Retiring allowances to teachers if superannuation scheme authorized by the Act of 1908 is established; and any other educational expenditure approved by the Department.

The method of financing Central Institutions is this: From the total expenditures (first approved by the Department) deduct income from fees and find

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total deficit; ask Board to state proposed expense for next year; after deducting from this the income from fees, pay the balance from two different sources—half from Imperial Exchequer, half as divided between (a) Local Authorities and (b) The Education (Scotland) Fund. If a Central Institution has certain endowments, the Department takes them to save this latter Fund.

Under this plan the Department aids Art, Commercial, Veterinary, Navigation and other special schools.

(B) DISTRICT EDUCATION FUND.

After above general charges are paid, the balance of The Education (Scotland) Fund is broken up into District Funds. The Districts (subject to combination if found desirable) comprise 33 counties and the 6 largest urban school-board areas, viz., Edinburgh, Glasgow, Aberdeen, Dundee, Leith and Govan.

The distribution among these 39 districts is made to School Boards in accordance with schemes of allocation prepared by the Department and so framed as to give greater aid to those districts in which per head of the population the burden of expenditure on educational purposes approved by the Department is excessive as compared with the valuation of the district. That is, the money is to be allocated upon a principle which takes account both of the relative cost of education and of the relative wealth or poverty of the district to which the distribution is to be made, as well as population.

In the application of the District Funds the principle applied is that the first charges on the Fund prevail: that is, all expenditure on the general educational services of the district, such as are not properly referable to any one School Board area, ranks as a first charge.

The existing Secondary Education Committees are utilized in applying District Funds. In every instance the School Boards of the district are largely represented on these committees, which may, therefore, be expected to perform a useful function in relation to all those forms of education which it may be beyond the resources of single School Boards to deal with.

The following items are prominent among the first charges on the District Fund:—

(1.) School Boards which have established Intermediate or Secondary Schools are to be recouped for reasonable expenditure incurred in respect of pupils drawn from surrounding parishes. Only so far as a school of this type is a central school serving not merely the parish but the district will it receive financial assistance from the District Fund.

(2.) Similar provision applies to Continuation Classes of an advanced character "providing further instruction for pupils who have left school" also to endowed schools under due safeguards. (In 1910 the Department paid about £112,000 to Continuation Schools.)

(3.) The District Bursary Scheme enables duly qualified pupils in each and every part of the district by means of bursaries or otherwise, to obtain education at a recognized Intermediate or Secondary School; or at a Supplementary Course of three years; or, where deemed expedient, at an Agricultural College, a Tech-

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nical College or other Central Institution, or at a University or Training Centre or Training College.

(4.) Payments may be made to the Committee in aid of travelling expenses and maintenance of special teachers whose services can be placed at the disposal of School Boards for instruction in technical subjects such as Agriculture, Horticulture, Physical Training, Cookery, etc.

(5.) One half the cost incurred by each School Board in providing medical inspection and supervision of pupils attending schools within their districts.

(6.) Grants-in-aid up to one half of capital expenditure of any kind, such as provision of schools or rooms for physically and mentally defective, blind or deaf mute children; for school gardens, laboratories, rooms for cookery, laundry etc., workshops, equipment for the use of travelling teachers or others employed by the committees.

(7.) Such further sums as the Department may approve for the promotion of education within the district generally.

RELIEF OF RATES.

After providing for the aforesaid payments and for the approved expenses of the Committee, the balance is to be distributed to the School Boards and managers of State aided schools within the district as an addition to the "fee grant", i.e., in relief of their ordinary expenditure.

The Department calls upon every Board to exercise the "critical function" of watchfulness as regards the first charges paid out of each District Fund, and to exert all legitimate influence to secure that no money is expended for district purposes without a reasonable assurance of adequate return. The chief end of this "critical function" is to insure the efficient and economical administration of the District Fund as a whole; and incidentally it cannot fail to have a high value as tending to foster the interests of individual Boards in the larger concerns of the district. This function extends also to the corresponding charges on the Education (Scotland) Fund itself—a circumstance which brings the several Boards into more direct and living contact with every element of importance in the educational fabric of the country.

BURSARIES.

Secondary Education Committees have not been slow to avail themselves of the opportunity given by the Act of 1908 to make payment out of the District Fund of such sums as they deemed necessary to enable properly qualified pupils to proceed from Primary to Intermediate or Secondary Schools. The expenditure upon bursaries from District Funds alone during the year ending 15th May, 1910, was £84,800. If to this be added an approximate expenditure upon bursaries of £65,000 from separate Endowment Funds administered by the Committees or by the Governors of the Endowments, a total of £149,800 is reached.

Expenditure of this kind is a necessary corollary of the system of Secondary Education which it is sought to establish, and in the more sparsely populated

parts of the country it is the only feasible alternative to providing at great cost a greatly increased number of Secondary Schools. The sum stated is so large, however, that in some cases at least it is feared that it has been in its essence either a subsidy to the parent or a means of indulgence to the pupil rather than a *bona fide* outlay upon the means of education, as intended.

A committee on Secondary Education, or the School Board or Secondary School may establish and maintain hostels for Junior Students, Bursars, or other pupils attending Intermediate or Secondary Schools; and if after careful management a deficit should occur, it may be paid out of the District Education Fund with the approval of the Department.

(2) LOCAL FUNDS.

FINANCES OF THE SCHOOL BOARDS.

There are in Scotland 970 popularly elected School Boards, and they administer locally in the parishes and burghs the primary system of public education. In addition, they manage Secondary Schools, Junior Student Centres and Continuation Classes. The facts and figures given below only deal with institutions managed by the School Boards, and in each type a considerable number of cases are not within the public system. The School Boards may, however, be taken to represent approximately the Primary system; and the Continuation Class system in so far as the latter is below the Central Institution standard.

The work done by the School Board system involves the education in Primary Schools of about 803,800 pupils on the register; in Intermediate Schools about 22,400; in Secondary Schools about 10,000; and in Continuation Classes about 100,000 young persons. Besides these there are the candidates for the teaching profession in the Junior Student centres.

These figures give an approximate idea of the volume of the work in which the moneys noted below are expended.

INCOME OF SCHOOL BOARDS.

The total income of School Boards for the year ended 15th May, 1909, was £3,649,416, and the expenditure £3,747,947. These amounts do not include balances. The income was made up as follows:—

1. School fees and books sold to pupils.....	£ 96,999
2. Grants from Scotch Education Department.....	1,543,287
3. Grant under Local Taxation (Customs & Excise) Act, 1890, and Education and Local Taxation (Scotland) Act, 1892.....	51,172
4. School Rates.....	1,427,707
5. Loans.....	452,175
6. Income from Endowments.....	16,922
7. Other receipts.....	61,154

£3,649,416

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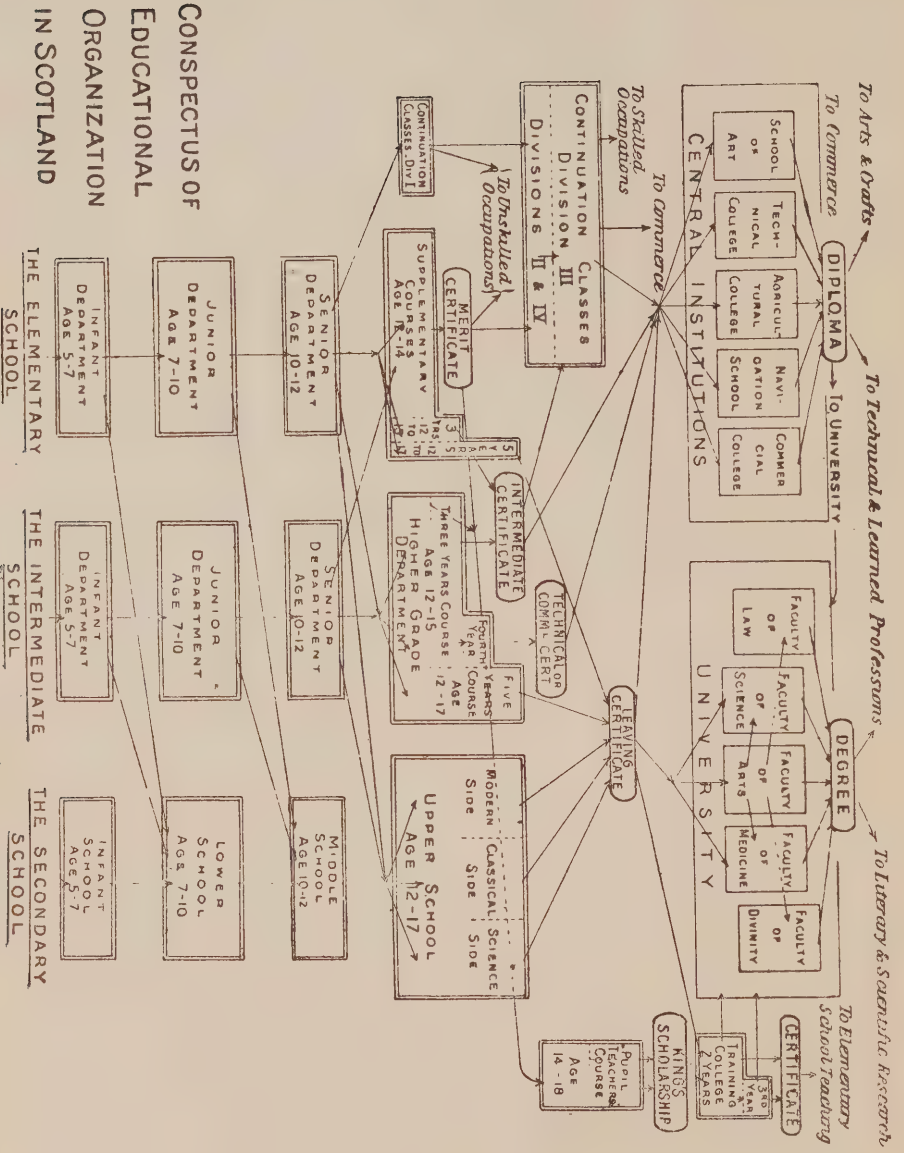
EXPENDITURE OF SCHOOL BOARDS.

The total is £3,747,947, made up as follows:—

1. Election of Boards.....	£ 14,746
2. Salaries of Administrative Staff.....	83,781
3. Salaries of Teaching Staff.....	2,050,522
4. Sites and Buildings.....	483,942
5. Printing, postage, etc.....	22,548
6. Books, apparatus, stationery.....	106,525
7. Rents, rates, etc.....	114,564
8. Furniture, repairs, etc.....	121,358
9. Fuel, light, cleaning.....	179,936
10. Interest on and repayment of loans.....	473,897
11. Other expenses.....	96,128
	<hr/>
	£3,747,947
	<hr/>

FINANCES OF OTHER LOCAL BODIES.

The finances of the Secondary Education Committees, the Central Institutions and the Universities have already been dealt with in so far as seems necessary for the purposes of this Report.



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CHAPTER XIII: CONVERSATION WITH SIR JOHN STRUTHERS.

*Information obtained from "Conversation" with SIR JOHN STRUTHERS,
Chief Secretary for Education for Scotland.*

DEPARTMENT OF EDUCATION AND NATIONAL SYSTEM.

There was a common Department of Education for both England and Scotland to administer grants which were given for purely Elementary Education as long ago as 1837; but as the system advanced and education widened and the amount of money spent became more important, Scotland in 1866 was separated from England and got her own grants from the Exchequer for Scottish education.

A word about the Scottish National System of education is essential, because all preparation for advancement in industry and commerce runs back to the fundamental question of primary education. Without a sound general education it is hopeless to do anything to build up Technical Institutions.

Scotland has probably the oldest National system of education in Europe—a school in every parish, whose ideal was to enable the better pupils to fit themselves for the University, the entrance standard of which was low. Amid changes and troubles that system of Parish Schools, in charge of men fit to prepare selected boys for the University, has endured till now, though in several respects it became inadequate as time went on. It was supplemented in recent years, the modern state of things beginning in 1872, when an Act was passed establishing for every parish a School Board elected by the people, and charged with the duty of providing sufficient schools and means of education for the people of the parish. Essentially each of those School Boards is an independent body.

COMPULSORY ATTENDANCE.

In Scotland all pupils must stay at school till they are 14. The School Board has certain power in individual cases to dispense with that requirement in cases of pupils over 12; but the Act of 1908, on which the Boards are acting very well, suggests that if a pupil is let away at 12 it should be made a condition that he returns to school part of the year, say in winter time in the rural districts, or attends Continuation Classes in the evening in towns till 16. So instead of stopping altogether at 14 they go on till 16 at least; and under the Act of 1908 every School Board has power to make attendance at Continuation Schools compulsory till 17. The Boards hesitate about putting it in force at once, but a number have proposed compulsion, and it is working quite satisfactorily. A good many others, Edinburgh for example, are thinking about it. Glasgow has already proposed modified compulsion as a first step in that direction.

ACT OF 1872.

Under the Act of 1872 the Parish Schools and Burgh Schools continued and hundreds of new schools were established because the Act introduced compulsory education up to a certain stage.

There was really no separation between Secondary and Elementary Education; every parish did its best to give both. In some parishes there was no Secondary Education; in some there was a great deal. Anything approaching systematic provision for Secondary Schools was in towns or burghs; though the rural parishes taught a few selected pupils Latin, Greek and Mathematics more or less in the schoolmaster's spare time. As time went on what might be called a separate system of Secondary Schools was evolved by agreement and discussion, and that movement culminated in the Act of 1908.

ACT OF 1908—SECONDARY EDUCATION COMMITTEES.

The Secondary Education Committees instituted by the Act of 1908 are part of a plan to do things which each School Board cannot be expected to do for itself. The Committee is really a co-operative union of the School Boards of the district.

There is a Secondary Education Committee for each of the six largest towns, then one for each county. This Committee is composed practically of representatives of the School Boards of both districts. The Committees are composed in various ways. Those School Boards which maintain a Secondary School have a right to direct representation; others which have no Secondary School combine in districts and elect so many representatives, and there are members, to a small number, added from the County Council.

STRESS UPON CONDITIONS FOR HEALTH.

The Act of 1908 lays great stress upon the health conditions of schools and children. Children who enter school will be medically examined, and re-examined at definite intervals, and special examinations will be made of all children reported by the teachers; the object of all this being to build upon the system of education measures for promoting the health of the country. Defective children found are set aside, and special education provided for them. If children come to school dirty, neglected and filthy, the School Board has power to summon the parent and ask the reason, and if not satisfied that the parent has been doing all he could, the Board can prosecute, and meanwhile take the child in hand. If satisfied that the parent has done what he could, and that the condition arises through insufficient means, then they have to feed and clothe that child till the parent is in a position to do so—the object being to make health considerations a much more important element than hitherto in the education of children, whether general or vocational—to make sure that the arrangements do not conflict with proper health conditions.

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SCHOOL BOARDS—FUNCTIONS AND POWERS.

The Department has not taken away the original powers of the School Boards, which they hold as fundamental, because they want parents to be able to say that they have a direct voice in choosing the teacher most suitable for the district, and in controlling to a certain extent the education of their own parish.

The school is always under the control of the Local Authority, which engages the teacher and takes all responsibility for the buildings. It gets grants from the Secondary Education Committee, but more or less on a fixed basis according to expenditure that has to be approved by the Department, and the Committee can remonstrate either way.

If a School Board fancied some apparently eccentric and absurd scheme of education, it would be at liberty to carry it out in its schools, and by law the Department could not do anything; but of course it does exercise enormous influence by giving grants to School Boards if they do certain things, and a School Board would have to carry out those absurd and eccentric courses entirely at its own expense, by means of a rate levied upon the parish. If a course of education does conform to the Department's regulations, then the Board get probably 50% of the whole cost; so that naturally there is a strong inducement to follow what everybody would think a proper course. The Department has a veto, but at the same time the Local Authority is independent in this matter and in fact has very considerable freedom in varying its courses of instruction within the Department's general regulations to suit its particular view. The Department tolerates all sorts of things by way of education in a particular parish, though they may think them unreasonable. It would be perfectly hopeless to thrust anything on the parishes on the ground that it would benefit the locality, if the School Board did not approve of it. In such cases the Department could only go on reasoning and hammering at them, but doing it in a reasonable spirit, with a little humour now and again. (Sir John added that he sometimes thought the Scotch were the only people in the world who appreciated humour).

SUGGESTION FOR CANADA.

Sir John remarked that Canada, having no State Church, afforded a fine opportunity for what might be called an "Established Schoolmaster" in every Township—not to be simply a teacher, but to take charge of the general education of a place and see that the standard of culture was kept up in that district. He had observed also that a majority of Canadian teachers were women; and while he had the highest admiration for women teachers, especially in junior classes, experience in Scotland had shown that it was absolutely essential for satisfactory education to have a man in every parish who is more or less in charge of education in the district, and who sets a standard.

VOCATIONAL INSTRUCTION AND GENERAL EDUCATION.

The feeling has been growing for ten or twenty years in favour of vocational instruction, that is, for direct application of education to some individual means of earning a livelihood, whether profession or trade. Yet even now the great subject of education in Scotland is general education; and though they are advancing very rapidly in the direction of special education, they regard the soundness of their Elementary and Secondary Education as the most important object they can possibly have in view, and that anything else done must be entirely subsidiary to that. Yet a feeling has been growing that general education may be too general; that when a boy leaves either Elementary or Secondary Schools he is going to earn his living in some particular way, and therefore it is well that in school his mind should be directed towards the kind of knowledge likely to be useful in his future occupation.

That is provided for both in Elementary and Secondary Schools. At 12 years average children are supposed to have completed what might be called a purely Primary Education; to have had good sound instruction in Reading, Writing, Arithmetic, some knowledge of Geography and History, some practice at Drawing, and some knowledge of Nature Study. For children who have not left the Day School at 12 there are courses classified roughly as Commercial, Industrial, Rural and Girls' Courses in Household Management; and in every school of any size which takes pupils beyond 12 the aim is to have one or more of those courses according to the size of the school and the nature of the locality. Those courses are making very great progress, and are very much appreciated. They are given by the regular teacher, and large town schools generally have sufficient teachers who have specialized in one or other subject to provide the necessary instruction in these Supplementary Courses more or less completely. In the country districts of course this cannot be so, and the County Committee is supposed to come to the rescue and provide a special staff of teachers of different subjects who will circulate through the county according to proper arrangement.

In the case of apprentice boys and girls in town shops, the difficulty of dealing with the employer is very great. A good deal of progress is being made in Edinburgh and Glasgow in the way of getting employers to make special arrangements for day classes, but substantially the continued education of those who have gone to work in towns is provided in the Evening Classes, which are connected with the Secondary Institutions.

VOCATIONAL TRAINING AND SPECIAL OCCUPATIONS.

The almost universal notion in Scotland is to give a boy the best general education possible as long as he will remain at school, and then let him go into the particular line of life he is to follow. Once he knows what further knowledge he needs, let him come back and make special arrangements for instruction; but so far as he has to acquire technical skill (manipulative skill), he would do that far better while earning his bread in remunerative employment.

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There is another function that a school can fulfil in that connection. In very many industries specialization prevails to a remarkable extent, and an apprentice may be working for years at only a little snippet of the whole thing, so that as to manipulative skill he is perfect, but he has not an all-round knowledge of his business. Such training is defective, and technical classes could supply what he does not know about it technically, as many of the Scottish institutions do. For example, in the Glasgow and West of Scotland Technical College there are classes for boiler-makers and every occupation of the district, in which the instruction is not merely theoretical but practical—not practical in the sense that a boy is trained to become a boiler-maker before he is a boiler-maker; but when he is a boiler-maker they say, "Now, here are certain things you want to know about the business, more or less theoretical, and there are certain other things you ought to be able to do". Then by arrangement with the trade they provide classes in the day-time, in the evening, in the morning, at all sorts of times.

If the grocers, for example, said they would like classes for the instruction of their hands, the Technical College would consider it, see what sort of attendance they might expect, invite two or three leading men in the industry, both employers and workmen, to join with some of the governors of the College in forming a Special Committee for a class of that character. Then they would search about for suitable instructors, and start a class in the College. That would happen in a lesser degree in Intermediate Centres such as Kilmarnock, and Hamilton, but could not be got in the smaller villages.

TRADE INSTRUCTION.

The West of Scotland College in Glasgow has a system of trade instruction worked out probably as well as anywhere in the world. It is not a system of preparing boys before they leave school for some industry; it supplements the workshop with instruction which the shop does not give, either theoretical, or it may be mechanical, in so far as the boy has been restricted to a small part of his trade.

The shipbuilders have arranged for some of their apprentices in the College. The apprentice works for a year; then they let him off to attend the Technical College in the winter, the employer paying his wages; then he goes back and works at shipbuilding in the summer. That goes on for three or four years and in the final year they let him go to College a full year without going to the workshop at all. They pay him according to arrangements made by individual firms. Many have gone the length of paying the apprentices' wages for the full time, even though they may have been out of the workshop for a whole year.

CONTINUATION CLASSES BY SCHOOL BOARDS.

What are called Continuation Classes had been in existence in Scotland for a generation, but as a rule flourished only in larger centres of population, which was very natural, because the classes were usually held in the evening

and difficulties of evening instruction in the country were patent. The Act of 1908 allows Boards to hold such classes in the afternoon or daytime, and suggests that in rural districts the pupils should attend the ordinary Day Schools in the afternoon, say through the winter months, but instead of being put into a class and taught along with other pupils, should be regarded as students studying on their own hook, the schoolmaster giving them advice and assistance at such times as he can spare. It is really reviving an old practice in Scotland, when farmers' sons and such people, who had long left school and were working on the farm, attended for two or three months in the winter time and studied their own particular subject—land surveying, improving their arithmetic, or anything they had a fancy for, the schoolmaster being at hand to give them what assistance they wanted.

The Act has brought a tremendous increase in the number of School Boards that have started Continuation Classes or made arrangements for the further education of children; and the Department hopes, by the usual kind and persistent pressure and reasoning, to get this practice made practically universal. These courses are largely in the evenings, but in the rural districts the day-time is possible and desirable because of the farm work in winter, where special arrangements can easily be made to allow pupils off.

CONTINUATION CLASSES BY EMPLOYERS.

Scotland has a fair number of instances, not very many, of individual firms starting Continuation Classes and continuing them on their own responsibility. They get a grant from the Department, but bear the deficit of expenditure which the Local Authority would have to bear. If it is recognized as being a proper institution, with proper teachers, etc., and if the Local Authority offers no objection, the Department gives a grant.

The North of Scotland Railway Co. maintain Continuation Classes in connection with their railway shops at Inverary, and do not call on the Local Authority to contribute anything. In the case of that railway school the Department pays roughly three-quarters of the expenditure.

All the Department's grants are paid to the managers of the schools, not to the Local Authorities, and it is for the Department to decide whether the school was one deserving State support. Whether it was under the School Board or under a body of private managers was immaterial; but as a matter of courtesy and good arrangement the Department always consulted the Local Authority as to the necessity for the school and as to why they did not take it up themselves.

VOCATIONAL TRAINING IN SECONDARY SCHOOLS.

In reference to vocational training in Secondary Schools, Sir John said he was speaking more of what he hoped they would have than of what had been actually achieved, because of the very, very strong trend in favour of general education in the Secondary Schools, and the difficulty of getting them to arrange a special course for entrance to any particular kind of institution other than

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a University. Yet in a fair number of centres the possibility of pupils going to the Technical College is being kept in view.

The stimulus for the establishment of a Technical Class is very often supplied by the people; it depends a good deal on the district. The School Board or the Secondary Education Committee has part of this duty, and lastly the Department and its Inspectors, who make sure that this matter is being considered. The latter form a very useful means of getting matters considered by the local people. The 67 Inspectors—28 full Inspectors and 39 assistants—cover a population in Scotland of about 4,500,000. The Inspector is the responsible person to whom all instructions are conveyed. The 28 inspectorates are arranged in four groups. There are now three "Provinces" and it was necessary for special reasons to make the North West Highlands a special district.

SPECIALIZED COURSES IN SECONDARY SCHOOLS.

In the Secondary Schools the principle of general instruction is strong, and they do not admit any specialization until pupils have got the Intermediate Certificate, at about the age of 15 or 16. Till that age every pupil is following the general course. Of course there is a certain amount of latitude, English being the all-important subject. The course includes also instruction in another language, ancient or modern, according to choice. Mathematics, History, Geography, Science and Drawing are the other five main subjects. After pupils have obtained the Intermediate Certificate the Department asks the Secondary School to propose any more specialized course, such as they think best suited for their pupils in view of their future occupation. Of course the majority of the pupils who stay on in a Secondary School to the age of 15 or 16 have in view a University course. The great bulk of the instruction, even after that stage, is on the same old University lines; but a certain number aim at going to a Technical College to prepare for engineering and such like professions, or to Agricultural Colleges; and if a school has a staff and equipment for it they will make a special course suitable for those pupils.

In the case of girls the Department very strongly presses the formation of special courses for those beyond 15 who have the Intermediate Certificate, to prepare them for managing a house in every way, Cookery, Laundry Work and what is called Housewifery forming the basis of the course. They always have English. They probably go on with a modern language which they have already studied, and according to their taste will continue Drawing or take up Music. They like to stay from 15 to 18. A good many take that three years' course, though a good many drop off after two years.

In all towns of very considerable size there is instruction in Woodwork for boys over 12. In the country districts there is a much greater diversity. It is a case of slowly getting teachers qualified, or of one county being more active in that direction than another. But the goal which it is believed will soon be reached, is to have Woodwork for boys of 12 and upwards as a general subject through all the Primary Schools, just as Drawing is at present. For boys of 15 the Department favours special courses, such as the Commercial Course

or that preparing for the Technical or Agricultural College, which will be optional with the locality, which has the authority.

LOCAL MANAGEMENT WITH CENTRAL GUIDANCE.

This combination of local management with central guidance—which is not absolute control, but approaching control—Sir John considered of enormous value; for while any system by which each parish in Scotland was left to provide the education itself might be a great deal cheaper than at present, it would be hopelessly insufficient; on the other hand, any system by which the Department took the management of all the schools, while it might be more economical than the present arrangement, would not be so satisfactory in many ways. Sir John wanted many brains actively thinking about these problems; and these cannot be got to think to purpose unless they are given responsibility.

There are certain things which even the counties cannot do for themselves, such as the training of teachers (which in Scotland is a national matter); also, University Education, the work of Technical Schools, Colleges and Schools of Art. There cannot be more than two or three outstanding institutions of the highest kind in a country the size of Scotland. Hence, in addition to the School Board for every parish, and a County Committee for every county, there are bodies for Teacher Training and for Higher Technical Education in each of the three "Provinces" which, for purposes of educational administration, were formed to centre around each of the Universities—Edinburgh, Glasgow and Aberdeen.

SYSTEM OF ORGANIZATION AND CO-OPERATION.

The system of organization is that in each "Province" in Scotland there is a Technical College and a School of Art; also a School of Domestic Science and an Agricultural College. These are the centres of operations; they give the most advanced instruction, and School Boards are asked to frame courses which fit into those of the Technical College, etc. That is gradually being done, so that a coherent, organized system of classes is being obtained. A conference was arranged between the Glasgow and West of Scotland Technical College and the Glasgow School Board, which till that time had not been co-ordinating their work. With difficulty they were persuaded to have a common system of organization in which the objective of the Continuation Classes conducted by the School Board should be the Technical College, and which would be beneficial to the pupils to the extent to which they carried it. Of course the co-ordination is a loose one, no rigidity being insisted on, but the Glasgow and Govan School Boards accepted the proposal, and now it has spread over practically the whole of the south-west of Scotland; so that classes in Kilmarnock, Dundurn, Paisley, Greenock, Hamilton, and many other places are all directly linked on to the Technical College at Glasgow.

A certain amount of work done locally counts for so much work done in the Technical College, and a student who has completed the course at certain

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other institutions, called Intermediate Centres, can pass on to a more advanced class in the Technical College. Each of those centres at Kilmarnock, Paisley, etc., is in turn a sort of centre of operations for all the smaller Continuation Classes held throughout the villages and country districts. The ideal, which has been largely accomplished, but is not absolutely universal, is to secure a certain coherence in the whole thing. The Technical College with the consent of the School Boards appoints one of their men, who now makes it his sole business to go round those schools and discuss with the managers what they might do and what they should aim at, how classes should be arranged, etc., also to report as to the quality of the work done. The Department asks him to send his report to their District Inspector, who adds such observations as the Department thinks proper before sending it to the manager of the school. Of course anything added is merely a suggestion, and has no legal authority. The system is based upon securing willing agreement, and it is only in the very extreme cases that the Department resorts to orders.

The Provincial Committee does not deal with co-ordinating between the Local Authority and the Technical College, because it specializes on the training of teachers. The Central Institutions are regarded as coming in the place of the Training Colleges, and the governors of the Centrals and of Agricultural Colleges as corresponding to the Provincial Committee for purposes of organization of Technical Education.

THE AGRICULTURAL COLLEGES.

The Agricultural College of a "Province" is under the management of a body of governors chosen by the separate counties throughout the "Province" with the addition of some representatives of the University, the Town Councils, etc., so that essentially the Agricultural College of a "Province" is under the management and influence of agricultural opinion in each of the counties that it serves. The institution is not, as in England, merely a College whose sole business is the training of from 30 to 100 students who are making a systematic study of agricultural subjects, and having nothing to do with the Training Authorities. In Scotland the Agricultural College is really a combination of the Agricultural Authorities—using that term for a group for half a dozen or more counties which can be combined for the advance of agriculture in the district. The training of a body of students who are going through the full course in the College is in a way only a by-product, and not the important object, which is the development of agriculture in the district by any means the College can employ. Obviously this process of relating to the College the instruction on agriculture in the Continuation Classes is one of the purposes.

AGRICULTURE.

The business of the Agricultural College in each "Province" is to draw up special schemes of instruction in Nature Study—not agriculture, but more general foundation for the specific study of agriculture—suitable for the schools of that



DUDDINGSTON, EDINBURGH: WORKING ON VEGETABLE PLOTS.



DUDDINGSTON, EDINBURGH: FRUIT PLOT.

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KETTINS, FORFARSHIRE: CLEANING VEGETABLE PLOTS.



KETTINS, FORFARSHIRE: ROCKERY AND HERBACEOUS SECTION.

district, and including the practice of gardening or School Gardening. When these are started by the School Boards the officials of the Agricultural College visit and advise with the teachers, and report on them to the Department's inspectors, who include in their general report on the school the remarks of those specialists on that particular subject, who are asked by the Department to advise, inspect and stimulate. The Department cannot have all sorts of people running in and out of the schools; and all this visiting of teachers from special institutions such as the Agricultural Colleges is done in a certain systematic way which the Department can control so that the school is not unduly interfered with, and so that there may be something like consistency in the advice that is being given to the school.

The report of such an officer of the Agricultural College goes first to the Department's Inspector, who sends it to the Department, which in turn sends it to the School Board who manage the school, with any additional comments they want to make; and if there is any reason for so doing, the Department sends a copy of that to the Secondary Education Committee.

In the County of Fife there is a combination of purely rural, mining, industrial and all sorts of classes. The School Boards make provision for Primary Education and the less advanced Continuation Class work; and the central towns provide, in addition, first-rate Secondary Schools. A strong Secondary Education Committee supplies specialist teachers for mining and other branches to circle around the district.

PARISH SCHOOLS AND BURSARIES.

In Scotland the traditional desire of some parents is for one of their boys to go to the University; and that applies very strongly in the more remote districts where there is no industrial activity. The most interesting instance is the Island of Lewis, where the population of 30,000 lives on what is largely a peat bog—just about the dreariest conditions for existence imaginable—and frightfully poor. Yet at Stornoway in recent years, under the system described, the Secondary School is filled with pupils from all parts of Lewis who are kept there by means of their bursaries of incredibly small amounts. In proportion to its population Lewis is turning out for the final Leaving Certificate (fitting for the University) a larger number of pupils per thousand than any other part of Scotland. It is astonishing. Many lads from the almost abject poverty of the crofter's house get on to the University and make their mark in after life. The same sentiment prevails in a place like Caithness, which has one of the highest records of pupils obtaining the Leaving Certificate. Banff and Aberdeen are also characteristic in that way. On the other hand, Glasgow, Fife and the Midlothians—all those industrial districts—are quite low down in the proportion of pupils who reach the scale of Secondary Education which fits them for the University.

INTERMEDIATE SCHOOLS, "CENTRES" AND BURSARIES.

Under the Act of 1908 the School Boards and Parish Schools are continued, but in addition there is scattered all through the country, a class of Intermediate

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Schools taking pupils to 15 or 16 for Secondary Education. Lastly, a smaller number of what might be called fuller Secondary School take pupils up to 17 and 18 and prepare them directly for the Universities—the standard of University education having in the meantime advanced enormously.

There is no rigid separation of the Elementary School from the Intermediate and Secondary. The old Parish Schools have full liberty to carry their pupils as far as they can, but the Department advises the school, in the pupil's interest, not to keep him at the original school for the honour and glory of the teacher, but to send him as soon as possible to a proper Centre. For that purpose there is a provision of money for Bursaries under the Act of 1908; so that if a boy in a Highland glen is found to be a promising pupil, the teacher gives him some instruction in secondary subjects, and then advises him to go to a Centre, there being always one within half a dozen miles or so. If the boy cannot travel home every day, and has to board at the Centre, he can get an allowance to help meet the extra cost by applying to the Secondary Education Committee. The principle is that it would be too costly to put a full quota of Secondary Schools in every parish, so it is made possible for the boy who lives in the most out-of-the-way corner of Scotland to be in the same position as regards Technical Education as if he were living next door to the Secondary School.

The Bursaries are not awarded by competition; it is a case of the boy being sufficiently qualified, as shown on an examination for that purpose. The parents may represent to the Secondary Education Committee, more or less confidentially, that they cannot afford to keep the boy at the Secondary School, and he gets help "as a matter of right"—as it is put in the Department's circular. At the same time the Department does not want to make it a matter of absolute right so that a head pupil's parents, who are wealthy farmers or have big incomes living far away from Secondary Centres, can come and say, "You must pay the whole of my boy's education at a Secondary School."

The Bursary plan referred to applies also to the Technical Classes. The Central Committee of each county has funds at its disposal from which it can make grants to assist students to go further than the district, to another Centre, for technical instruction. Thus if a boy did not live in Glasgow he could yet get the benefit of the Technical College there. The plan does not give him absolute equality, but it does a great deal to mitigate the inequality as between young men living in Ayrshire and those living in Glasgow.

TRAINING TEACHERS FOR TECHNICAL EDUCATION.

A Provincial Committee, which consists of representatives of the Universities and higher Technical Schools, provides for the Training of Teachers. In order to become a teacher of even a Primary School, the candidate must go through a general course. Beyond that the Department offers him the opportunity of getting special qualifications. For example, for teaching in Rural Schools, he can secure qualification through a certain course in Agriculture and subjects relating thereto over and above the rest of his work. That instruction is to be got either at the Agricultural College or through Instructors sent out from it, or through people specially approved by the College.

Scotland has not had difficulty in the selection of special teachers in the technical and industrial field as between rival factions wanting to have a man who is affiliated with organized labour or as representing free labour. That point is never enquired into. The Local Authority makes the appointment, and invariably sets itself to enquire who is the most capable teacher of the subject, and not whether he is a member of a Union or not. It is only very accidentally, or probably for some special personal reasons that the question whether a man is a member of the Union or not ever comes up for consideration. The Department has had no hint of any local difficulty where prejudice might be shown against one teacher and in favor of another in that respect.

There are no Central Institutions or others in Scotland doing Trade School work—teaching a trade as such—and there is no movement in favor of it at present.

In Elementary Technical Schools in towns and cities, for a subject like Engineering, the Department would expect as teachers not merely mechanics of ability, but graduates of Technical Colleges. For an ordinary handicraft subject they want capable workmen who can teach. Experience of Continuation Schools had made them distinctly doubtful of having technical subjects taught well by the ordinary school teacher. He would do perfectly well in Arithmetic or Mathematics applicable to technical industry, but technical instruction requires men who are masters of their craft or business. In textiles you must have a man who is really a capable spinner, weaver, dyer, etc, and the difficulty is to get men who combine that knowledge and ability with sufficient general education and power to teach. In the larger centres there is no difficulty in getting such men by offering decent salaries, but in smaller classes, less advanced, there is difficulty. If choice must be made Sir John was very distinctly in favour of the man who knows the practical work and can do it; teaching ability will come from practice. In large towns like Edinburgh short courses in the art of teaching are being provided for such people. These help them to know more or less how to handle the classes. The engagement of those men is left entirely in the hands of the Local Board or the County Committee, and as a rule, except in large towns, the latter make the selection.

"EDUCATION FOR SCOTLAND FUND."

"The Education for Scotland Fund" has a most complicated story. It is constituted of amounts, which as grants-in-relief of local taxation, were given to education. They have been "pooled" and re-allocated for various purposes, the first one being the maintenance of Central Institutions; next, the maintenance of Secondary Schools; thirdly, the provision of Bursaries to enable suitable pupils to attend Secondary Schools; fourthly, various other matters which a small School Board cannot reasonably be expected to do for itself, and which a combination of Boards represented in a County Committee can do for all the parishes collectively, such as providing teachers of special subjects. Thus if a parish is not able to employ a teacher of Cookery all to itself this Committee employs several and circulates them around the several districts. So with

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manual work, woodwork and other subjects. The County Committee does that.

OTHER FUNDS FOR TECHNICAL INSTRUCTION.

The Department spends in grants for Continuation Classes about £112,000 a year. That is exclusive of the grants to the Central Institutions. For Continuation Classes the Department makes the grant according to attendance paying three-fourths of the expenditure after deducting revenue from fees. There are a number of schools or classes which do not get quite three-fourths of their expenditure.

The plan of financing Central Institutions is to take the total expenditure which has first been approved by the Department, ask the Board of Governors to state their proposed expenditure for the next year, with usual increases or diminutions and reasons, and after deducting from that the income from fees, to pay the whole balance from two different sources—half from the Imperial Exchequer, and the other half about equally from rates by the Local Authorities and from the Education for Scotland Fund. If the Local Authorities exceed the estimated deficit, and the increase is reasonable, the Department admits it. If a Central Institution has certain endowments, the Department takes them to save the Education for Scotland Fund.

HOW THE EDUCATION FUND IS DIVIDED.

There is a point that the authorities are beginning to recognize now. The first charges upon this Education Fund are those for the training of teachers and the maintenance of the Central Institutions. When those are served, the balance is divided to the various counties according to population, and inversely to their valuation—the richer a district the less it gets per head of the population. Then the first charges upon the County Fund are the proper maintenance of Secondary Education, provision of Bursaries for Secondary Education in the district, the supply of circulating teachers, and one or two minor items such as medical inspection.

After those are satisfied the balance is distributed pro rata to the School Boards of the county; so that if the Department spends more upon the Central Institutions there is so much less to distribute to the counties; if the counties spend more on the Secondary Schools, Bursaries, etc., there is so much less to distribute to the School Boards. What the School Boards get is used in relief of the rates; so that really every halfpenny spent on the Central Institutions means something out of the pocket of the ratepayer in the long run. That works well, having the great advantage of securing proper attention to advanced education which did not appeal to the ratepayer. If the Department said, "The maintenance of these Central Institutions is to be a charge upon the local rates," the whole of Scotland except two or three sections would object. Under the existing plan, since the Department is charged with the administration of the law, of the Parliamentary grants and of the Education for Scotland Fund,

whether more or less is to be spent out of the County Fund on Secondary Education—with less going to the School Boards for the relief of rates—depends to a certain extent on the Department, which has to be guided more or less by what they feel to be the local opinion.

FINANCING SCHOOLS OF ART, ETC.

The three large Schools of Art in Glasgow, Edinburgh and Aberdeen—the two first being of the very highest rank, with many features of highly specialized ability in their particular lines, and with an abundance of students and a very high reputation in the Art world—are financed on the lines described for Central Institutions. In Glasgow, Edinburgh and Aberdeen the Colleges of Domestic Science or Household Arts, the Commercial College (called the Athenæum) in Glasgow, also the Veterinary College, and the Navigation School at Leith are all maintained in the same way. There is not sufficient local support for those schools, so the Department meets the whole expenditure after deducting revenue from fees, half of amount being from the Education for Scotland Fund.

One half of the expenditure for buildings and equipments for these Schools of Art and Domestic Science Colleges is met by the Department if their plans are approved, and the other half is found by the locality, through subscriptions or otherwise.

There are separate grants to the Universities, which are partly directed towards scientific education.

DEVELOPMENT FUND FOR RESEARCH.

Lately a Development Fund has been established for the United Kingdom to aid many things, such as agricultural research; and institutions such as Agricultural Colleges in Scotland may be expected to develop research work through grants from that source. So far as agriculture depends upon information, instruction and advice, all operations will be conducted through these Agricultural Colleges. There is a Development Commission for the three Kingdoms which administers the Fund to the extent that grants are not paid from it except upon the recommendation of the Development Commission. Any body of persons or any government department may make application to the Commission for a grant for a specific purpose, and justify their application. The Scottish Department made application lately to the Development Commissioners for a grant for the Agricultural Colleges in Scotland, and got a grant for capital expenditure of £60,000 and a promise of an annual amount which depends upon circumstances.

CHAPTER XIV: ORGANIZATION OF EDUCATION IN EDINBURGH.

SECTION 1: THE EDINBURGH SYSTEM.

The capital of Scotland has always held a high place in the provision of education, and the juvenile part of the population enjoys facilities in all grades which are probably unsurpassed elsewhere in extent and quality. The number of independent bodies concerned with the problem of education is great and these engage in an honourable rivalry in which, under the guidance of the Scotch Education Department, little of overlapping or unhealthy competition is to be discerned.

The multiplicity of administrative bodies, and the mutual relations of the various types of institution, present a difficult and perplexing problem. It will be seen, however, that beneath this apparent complexity there lies a well ordered and organically articulated system, in which may be found most of the elements demanded by the modern theory of education.

The following classification may be given:—

A. University Education.

1. The University of Edinburgh, with faculties of Arts, Science, Medicine, Law, Divinity and Music.
2. School of Medicine of the Royal Colleges.
3. The Edinburgh School of Medicine for Women.

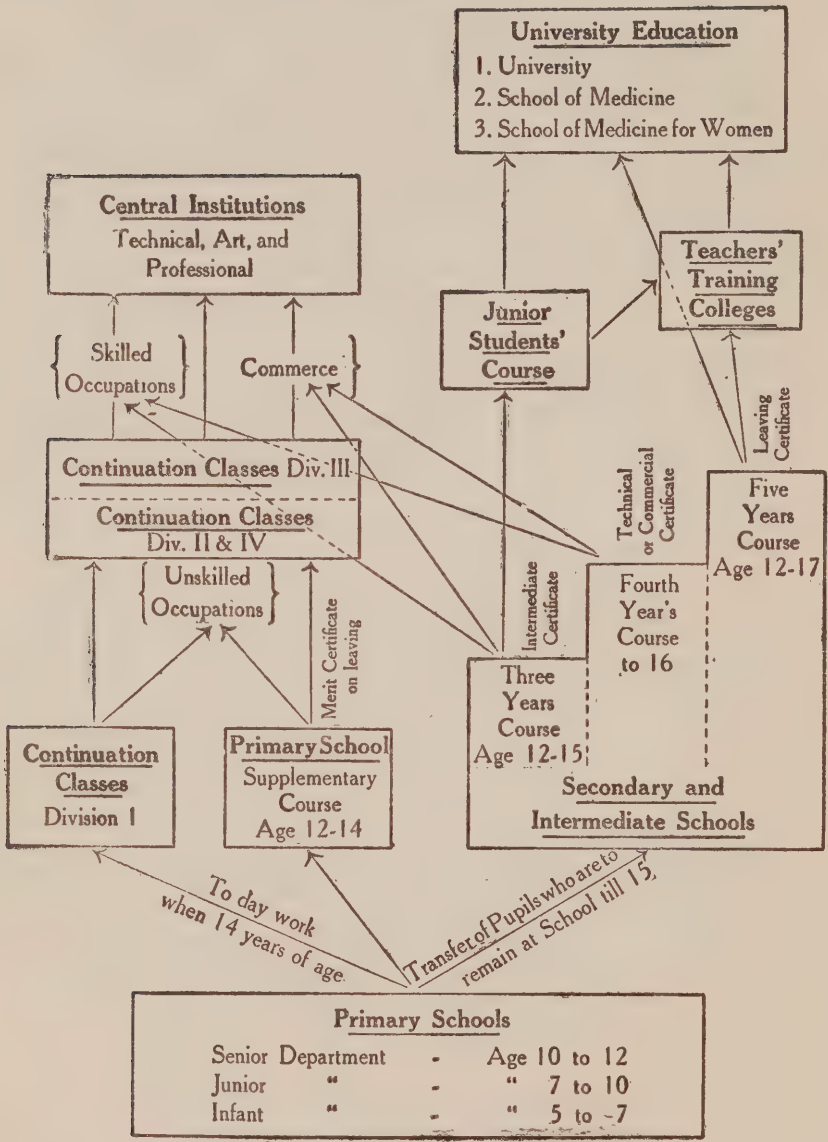
B. Technical, Art, and Professional Instruction.

1. The Heriot-Watt College.
2. The College of Art.
3. The Royal (Dick) Veterinary College.
4. The Dental Hospital and School.
5. The College of Agriculture.
6. The School of Cookery and Domestic Economy.
7. The Training Colleges for Teachers.
8. The Continuation Classes of the Edinburgh School Board.

C. Secondary and Intermediate Education.

1. The Endowed Schools.
2. The Private Schools.
3. The Schools of the Edinburgh School Board.
4. Junior Student Centres (Training of Teachers).

Diagram shewing the connection between
the various Types of Institution



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D. Primary Education.

1. The Schools of the Edinburgh School Board.
2. The Voluntary Schools.

E. The Special Schools and Institutions.

1. Endowed Hospital Schools, viz.:—
Donaldson's Hospital.
John Watson's Hospital.
Trades Maiden Hospital.
The Orphan Hospital.
2. The Royal Blind Asylum and School.
3. The Institution for Deaf and Dumb.
4. The Special Schools of the Edinburgh School Board:—
Willowbrae Defective.
Duncan Street Defective.
St. John's Hill Day Industrial.

ADMINISTRATION OF EDUCATION.

It will thus be seen that a very ample and diversified system of education exists. From the number of institutions and the variety of public bodies concerned in their management, there ensues that vigorous and widespread interest in educational welfare which is characteristic of Edinburgh.

One part of the system is, however, wanting. There exists in the city no central institution for music which would link up such instruction as is given in the Primary and Secondary Schools to the advanced work done by a relatively small number of students in the University, although in Evening Classes in the Heriot-Watt College instruction is given in the theory of music.

The population of Edinburgh in 1910 was 320,315, and the number of persons engaged in the work of education, as members of managing bodies, administrative officers, teachers of all grades, and subordinate workers, may be stated at not less than 3,500. The annual expenditure on the whole system is approximately not less than £500,000 (\$2,400,000); and in spite of the great number of independent managing bodies it may be said that the expenditure results in an efficient and characteristic system. When it is borne in mind that in each local area of England under the Act of 1902 the co-ordination of all grades of education is promoted by one local Education Authority, it will be realized that the efficiency of the system of the Scottish capital gives strong evidence of the cordial co-operation and high aims of the many bodies engaged in the work of education.

The work of the office of the School Board is divided into the following departments:—Elementary Education, Higher Education, Medical, Educational Information and Employment Bureau, Stores, Works, School Attendance, and Finance.

VOCATIONAL GUIDANCE.

The Edinburgh Board has a full Medical Inspection staff and an Employment Bureau of proved success. The former attends to the physical welfare of the child throughout his school career; the latter picks him up as soon as he is near the leaving age, advises him as to the pursuit for which he is fitted and as to the opportunities for employment in the city; and frequently secures him a position under satisfactory conditions. The employers of the city are in active and cordial co-operation with the Bureau, and also with the highly-organized system of Continuation Classes which the Board has established.

EDUCATIONAL FINANCES.

The revenue of the Board applicable to the year ending May 15th, 1910, came from three sources, as follows:—

(1) *From Government (per Scotch Education Department):*

	£	s.	d.
Day Schools: (a) Code Grants.....	50,255	19	9
(b) Relief of Fees.....	21,000	0	0
Continuation Schools: (c) Code Grants.....	9,139	2	1
From Education (Scotland) Fund.....	22,275	13	11

Total Income from Government..... £102,670 15 9

(2) *From Local Rating Authority:*

School Rate.....	138,000	0	0
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(3) *From miscellaneous sources:*

Fees, books, etc., sold, Endowments, etc.....	6,719	6	7
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Total from Rates, etc..... £144,719 6 7

Total from all sources..... £247,390 2 4

Of the total revenue the sum of £44,484 2s. 2d. was expended in the repayment of loans (principal and interest) and in respect of capital expenditures not covered by loans. When that amount was deducted from the income from rates, etc., the sum of £100,235 4s. 5d. remained to be applied to maintenance, together with the sum of £102,670 15s. 9d. from the Government.

The maintenance expenditures were as follows:—

(1) *Education Expenses:*

	£	s	d
(a) Day Schools.....	176,301	1	10
(b) Continuation Schools.....	14,955	19	4
(c) Administration, Etc.....	10,592	6	5

Total..... 201,850 7 7

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The percentage of the total expenditure of each of these three items is as follows:—(a) 71·6%; (b) 6·1%; (c) 4·3%.

The increased provision made for Education in Edinburgh by the Local Authorities is shown by the yearly amounts from the rates, as follows:—

Year.	Population	Amount. £
1880.....	235,670	23,356
1890.....	302,262	52,170
1900.....	317,459	99,106
1910.....	320,315	138,000

SECTION 2: PRIMARY EDUCATION.

CLASSIFICATION OF PUPILS.

In the 39 Primary Schools under the Board the classification of pupils follows lines laid down by the Scotch Education Department, viz. —Infant Division, in which instruction is provided suitable for children under 7 years of age; Junior Division, for children between the ages of 7 and 10; and Senior Division, for pupils between 10 and 12.

Liberty of classification irrespective of age is, however, permitted provided that satisfactory reasons can be shown for the retention of children in any Division beyond the ages specified.

The instruction given in these Divisions is so graded that the pupils are led by easy stages to the standard of attainment necessary for the Qualifying Examination, which forms the gateway to the Higher Grade School or to the Supplementary Courses provided in 32 of the Primary Schools.

GENERAL FEATURES OF PRIMARY CURRICULUM.

The following is an outline of the instruction given in the four Divisions, though the Curriculum varies slightly in detail to meet requirements of school districts.

In all Divisions provision is made for instruction in Reading, Writing, and Arithmetic, according to their degree of advancement; also in Physical Exercises, Singing by note, Drawing, and the committing to memory of pieces of poetry of literary merit, while girls receive instruction in Needlework. In addition a certain time is devoted to Religious Instruction and the teaching of temperance, and every opportunity is taken to train the children in habits of punctuality, cleanliness, neatness, and good manners, and in the duty of consideration and respect for others.

In the Infant Departments the instruction is necessarily of an elementary nature, and full use is made of Kindergarten methods.

In the Junior Divisions a start is made with the study of Geography; practice is given in the speaking of English; and Nature Study is introduced, the object of the latter being that children may obtain by means of observation

and inquiry a knowledge of common objects, natural phenomena, and School surroundings. In the Senior Divisions the foregoing subjects are continued and amplified, and the study of History is introduced.

Instruction throughout the Divisions is so graded that normal pupils may complete this stage about the end of their 12th year, when, on being certified by the class-teacher and by the Headmaster to be of good proficiency in class work, they are presented to H.M. Inspector for approval of enrolment in a Supplementary Course or Higher Grade Department.

This presentation is termed the Qualifying Examination.

Pupils so presented are expected:—

- (a) To read at sight with good pronunciation and intelligent phrasing, narrative prose of moderate difficulty.
- (b) To write to dictation with good spelling and legible and regular handwriting.
- (c) To answer questions as to the subject matter of, and the meaning of words and sentences in the class reading-books.
- (d) To write a composition, the heads being given, or to give in writing the substance of a passage read.
- (e) To know the four rules of arithmetic as applied to whole numbers, easy vulgar fractions and decimals to three places, and to be expert in applying this knowledge to the calculation, both mentally and on paper, of simple sums in money and in the common weights and measures.
- (f) To be reasonably proficient in the other subjects included in the scheme of work of the class.

The qualifying stage being passed, those pupils who aim at obtaining the Intermediate Certificate enrol in a Higher Grade School, but those who are to leave school at 14 proceed to the Supplementary Courses.

SUPPLEMENTARY COURSES.

In these courses which are provided in thirty-two of the Primary Schools the curriculum is in the main a continuation and development of the subjects previously studied, but fresh interest is gained by directing attention to their bearing on the probable requirements of the pupil's after-school life.

THE COMMERCIAL COURSE.

Pupils who are likely to engage in commercial pursuits enter the *Commercial Course* in which endeavour is made to give them such familiarity with principles of arithmetic as will enable them to deal with concrete cases such as occur in actual business transactions. The more ordinary methods of book-keeping are explained and illustrated by keeping accounts in simple form; the purpose and proper form of common commercial documents, such as invoices, receipts, cheques, etc., are explained; and systematic exercise is given in handwriting with a view of securing speed while preserving legibility and correctness of form.

THE INDUSTRIAL COURSE.

In the *Industrial Course*, other pupils receive instruction in elementary Geometry and Mensuration by construction and measurement of figures drawn to scale by use of compasses, protractors, and set squares. The use of "graphs" to

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indicate the relation of varying quantities is taught, and the methods of measuring solids are indicated; practice is given in Arithmetic, and the pupil is made familiar with the use of the ordinary foot-rule and decimally divided scales. Pupils also attend the school workshop, where they are taught the proper use of tools and are exercised in the production of various objects from working drawings, as well as in the construction of such drawings from actual objects. Those sufficiently advanced are also instructed in the simple principles of Mechanics and in such problems as are contained in elementary text-books on Building Construction or Machine Construction and Drawing.

THE HOUSEHOLD MANAGEMENT COURSE.

Girls have a *Household Management Course* giving a preparatory knowledge of the essential branches of housewifery. It comprises a series of carefully co-ordinated lessons in Cookery, Laundry Work, and Needlework, including mending, darning and cutting out, Dressmaking, and the use of the sewing machine. In a number of the schools the girls also obtain practice in the actual management of a house, with consequent marketing and keeping of household accounts. In these lessons every care is taken that the pupils clearly understand and appreciate the "reason why" of the practical methods taught.

GENERAL STUDIES.

These Courses aim not merely at the preparation of pupils for any particular occupation, but the production of useful citizens, alive to their responsibilities, and with capacity to enjoy rationally their leisure time as well as to earn their living. Hence certain subjects are in all cases combined with instruction special to the particular Courses. This more general instruction includes English, in which the main object is to create a taste for good literature; home reading in conjunction with systematic lessons in composition; proper care of the body, thrift, conditions of trade and employment, institutions of Government, and history and geography of the Empire.

In the Supplementary Course each pupil is required to keep a record of the work done, for submission to H.M. Inspector, and this record forms the basis of the entries on the Merit Certificate which marks the conclusion of Primary School Education, and is the passport to the Division II. Classes in the Evening Schools.

CENTRAL SCHOOLS.

Owing to varying numbers in attendance at Schools, it is not always practicable to carry on the three Courses above indicated, and in some cases it is necessary either to omit one other of them or to form combined Courses. In view of the fact that this cannot be regarded as a satisfactory position, the Board in 1909 adopted a resolution that with the view of facilitating the classification of the pupils, of reducing the cost of equipment, and of providing a staff more

suitably trained to give the required instruction, it was desirable that Central Schools should be established in which Supplementary Classes only should be accommodated.

DETAILS OF SOME SUBJECTS.

The following details with regard to the instruction in some of the particular subjects may be of interest:—

Hygiene and Temperance.—As in former years regular instruction is given in these subjects. A "Syllabus of Lessons on Temperance" was recently issued by the Scotch Education Department, and this the Board have agreed should now be used in the Schools. In the classes below the Supplementary Course this instruction is given in conjunction with Nature Study and Physical Training, or as part of the general training of the scholars in good habits. In the Supplementary Courses the work done forms part of the instruction as to the Laws of Health, and is of a more systematic nature.

The Scriptural aspect of Temperance is also dealt with at least once a month in the time set apart for Religious Instruction.

Singing.—The six masters employed specially for this subject devote their time mainly to the classes in the Senior Division and Supplementary Courses of the Schools visited by them. The Singing of the other classes in the Schools is taken by the class teachers under the supervision, in the case of the Junior Division, of the visiting master.

Manual Instruction.—Manual Instruction in the form of Woodwork and Drawing is given to boys in all the Schools. The instruction is conducted in 33 School workshops, 22 of which also serve as Cookery class-rooms. During the past Session 4789 boys received instruction. The work is mainly confined to pupils over 12, but in the course of the year 216 boys received instruction before reaching that age.

Needlework.—This subject forms a part of the curriculum in all the Schools, and except in three Schools, where the instruction is given by the ordinary staff, Sewing is taught by special teachers. Dressmaking is also taught in a large number of Schools. In only one is the work carried on by the Sewing Mistress without an assistant; in 20 Schools the Sewing Mistress had one Sewing assistant; in 7 Schools two, and in eight Schools three assistants. The instruction is, as a rule, highly spoken of by H.M. Inspectors.

Cookery, Laundry Work, and Housewifery.—There are now 13 teachers whose whole time is employed in giving instruction in these subjects throughout the different Schools, provision having been made for girls in these subjects in all schools but three.

School Gardens.—As an adjunct to Nature Study, gardens or flower-plots, which are cultivated by the pupils, have been provided in connection with 11 of the schools, with one or two exceptions these being in some part of the School grounds. Headmasters are unanimous in speaking highly of the educational value of this instruction, which is easily co-ordinated with other subjects, gives reality to the Nature Knowledge lessons, and is a strong factor in curbing tendencies to wanton mischief and destructiveness. Such gardens are a comparatively recent development in Scotland.

SECTION 3: CONTINUATION CLASSES.

These classes are for those who have completed the Supplementary Classes, and for others who have gone to work after leaving the Elementary Schools. Their main objects may be set forth in four divisions :

(1) Bodily well-being through maintenance and improvement of the health of young people. The aim is that those children shall have sound bodies, enjoyable health, and grow up in a wholesome, healthy way.

(2) The enlargement of the sympathetic interest of the pupils and the broadening and refining of their interests and sympathies by the influence of good books and the interest of good literature, and by good reading and instruction in regard to the things they ought to know about.

(3) That the boys and girls should be equipped for the practical work they have to do, and that they shall possess competent knowledge of some craft,

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industry or occupation which offers reasonable prospect of livelihood in adult years. When the boy is attending the Continuation Classes he is learning his trade through practical work for wages, and in the evenings or afternoons attending these classes where he receives instruction and training to supplement what he learns in the shop, office or factory.

(4) The inculcation of a sense of civic responsibility. The aim is that the boys and girls over 14 shall recognise their obligation as boys and girls living in Edinburgh, and that they shall think of the responsibilities and duties of communal life as well as of its rights and privileges.

These are the four main things: health, wider interests and sympathies, practical ability in occupation, and good citizenship.

The development of the Continuation Classes in Scotland generally and in Edinburgh particularly has been remarkable during the past few years, the latter being due to the new policy initiated about 8 years ago by the Edinburgh School Board. To-day the standard of attainment is infinitely higher than it was 10 years ago, and the pupils are vitally interested in their work. The change in the standard of attainment and in general tone is due to several causes, one being the introduction of practical experts to teach scientific and technical and trade subjects in the Continuation Classes.

ORIGIN AND PROGRESS OF CLASSES.

School Board Public Evening Classes were begun in 1873, when the total number of pupils enrolled in the 11 centres opened in Edinburgh was 983, and average attendance 410. For the first 13 years the number in attendance varied little; in only one year previous to 1906 did the enrolment rise above 4,000. Since 1904 the Edinburgh School Board has devoted very special attention to its system of Continuation Classes. The co-operation of employers, social workers, voluntary agencies, parents and teachers, has been enlisted, with the result that in 1910 the number enrolled was slightly more than 10,000. Since 1905 there has been an increase in the number attending of 6,500, or 186%. The Board's policy has been referred to in the Education Department's Blue Book in the following terms, viz.:—

An example of what can be achieved by well organised voluntary effort is again furnished this year by the notable further increase in attendance at the Continuation Schools of the Edinburgh School Board.

The following points are interesting, viz.:—

(1) That while the number of pupils in attendance has almost trebled itself since 1904-5, the total cost to the rates has not quite doubled itself.

(2) That whereas in 1904-5 with only 3,600 odd pupils the cost per pupil was 13s. 9d., in 1908-9 with practically double the number of pupils the cost per pupil was only 9s. 9d.

(3) That the increase in numbers has been steady since 1905-6; and that for the last three years the ratio of increase has been practically constant showing in round numbers a yearly average increase of 1,170 pupils.

(4) That in 1904-5 when the numbers were lowest the cost per pupil to the rates was highest.

SCOPE OF WORK.

In the years immediately succeeding the passing of the Education Act of 1872 the chief function of the Evening School was to make good the defects of day-school education, and to provide instruction in the elements for those who had never been in attendance at a day school. Within recent years it has been more and more the object of the Continuation School to take up the work of education at the point where the day school leaves it, and to give some knowledge of the underlying principles of the occupations followed by the pupils. Since 1893 there has been a Special Code of Regulations for Continuation Classes. There it is specifically stated that the classes may be held at any time of the day, morning or evening; hence the substitution of the name Continuation Classes for the name Evening Schools. The present code makes provision for

(1) Classes for the completion of general elementary education—Division I.

(2) Classes for the elementary instruction of pupils in special subjects, especially such as may be of use to pupils engaged in or preparing for any particular trade, occupation, or profession—Division II.

(3) Organised courses of systematic instruction arranged with a view to fitting students for the intelligent practice of particular crafts, industries, or occupations—Division III.

(4) Auxiliary Classes for instruction in Physical Exercises, Military Drill, Vocal Music, Wood-carving, Fancy Needlework and Elocution—Division IV.

REQUIREMENTS OF DEPARTMENTS.

By the Education (Scotland) Act of 1908 the scope of Continuation Class work has been considerably widened; its organization being no longer left to voluntary action of School Boards. Section 10 of the Act lays upon School Boards the duty of making suitable provision of Continuation Classes for the further instruction of young persons above the age of 14 years with reference to the crafts and industries practised in the district, and also for their instruction in the English language and literature, in the laws of health and in physical training. The same section confers upon School Boards the power to make, vary, and revoke bylaws for requiring attendance at Continuation Classes of young persons between 14 and 17 years of age.

In a circular explanatory of the provisions of the Act the Scotch Education Department has pointed out that School Boards in industrial districts have no more important or pressing task before them than the fostering by all means in their power of a movement for the better use of the years of adolescence as a preparation for adult life. The question of the exercise of the powers conferred by Section 10 is referred to as follows:—

Before applying compulsion every effort should be made by the provision of suitable instruction at convenient hours, by conferences with employers and associations of workmen and by co-operation with other agencies to stimulate voluntary attendance. When compulsion is resorted to it might be limited in the first instance to those who have not received the minimum (1½ years) of Supplementary Course instruction before leaving the Day School.

EXTENT AND CHARACTER OF CLASSES.

The School Board's Continuation Classes are carried on in 26 schools. These form the connecting link between the Primary Schools and the five Central Institutions. They serve the needs of pupils who have to work during the day

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but desire either to extend their general knowledge or to make a beginning of studies bearing on the occupation upon which they have entered.

Much attention has in recent years been given to these classes, and to bringing them into vital contact with the city industries and occupations. The Board works in close co-operation with employers of all kinds and receives from them valuable advice as to forming of courses and actual requirements of the industries. The classes meet on three nights a week, and are held in summer as well as winter. It is found that a well-organized, well-staffed voluntary system attracts large numbers of the city youth of both sexes, and compulsory attendance has not been introduced, although the Act of 1908 gives power to the Board to frame by-laws to that effect. In the winter of 1910-11 the number of students was 10,099; in the summer of 1911, 3,020.

The education in these classes is practically free, the fee for the Session (5s.) being returnable in all the schools (except 3 set apart for Adults over 20 years of age) at the close of the session to each pupil who makes 80% of possible attendances.

The range and variety of instruction may be gathered from the following list.

COURSES AND SUBJECTS.

Division I.—Classes for the completion of General Elementary Education.

English and Arithmetic, and one or more of the following—The Empire, Civics, The Laws of Health, Drawing, Woodwork, Common Commercial Documents, Needlework, Cookery, Laundry Work, Dressmaking, Millinery.

Divisions II. and III.—Specialized Classes and Courses.

ENGLISH COURSE:—

English, Composition, English Language and Literature.

COMMERCIAL COURSES:—

(i) Shorthand Course:—

English, Shorthand, Typewriting.

(ii) General Commercial Course:—

Two or more of the following—Commercial Arithmetic, Business Procedure, Elementary Book-keeping, Shorthand, English, Commercial Geography, French, German, Esperanto.

(iii) Combined Commercial Courses:—

Business (Operative), Business (Historical, Geographical and Economic).

TECHNICAL COURSES:—

(i) Elementary Engineering.

(ii) Elementary Physics.

(iii) Constructional Engineering.

(iv) Elementary Building Construction.

(v) Plumbers' Work.

(vi) Carpentry and Joinery.

(vii) Cabinetmaking.

(viii) Upholstery.

(ix) French Polishing.

(x) Printing.

(xi) Baking and Confectionery.

(xii) Tailors' Work.

(xiii) Plaster Work.

(xiv) Brassfinishers' Work.

ART COURSES:—

(i) General Art Course.

(ii) Wood Carving and Design.

(iii) Modelling in Brass and Copper.

(iv) Modelling in Leather.

DOMESTIC COURSES:—

Two or more of the following—Cookery, Needlework, Dressmaking, Laundry Work, Housewifery, Millinery, and First Aid, Home Nursing, Hygiene and Temperance.

Division IV.—Auxiliary Classes.

- | | | |
|--------------------------------|--------------------|----------------|
| (i) Physical Exercises. | (iii) Vocal Music. | (v) Elocution. |
| (ii) Swimming and Life Saving. | (iv) Wood Carving. | |

The co-ordination of the work of these classes to the higher work in the five Central Institutions is ensured by frequent conferences of the teachers and administrative officers concerned, and by the issue of a joint prospectus giving all the details and the relationships of the various courses.

ELEMENTARY TRADE INSTRUCTION.

Special attention is directed to the efforts of the Board to provide proper facilities for elementary trade instruction. In connection with the new Supplementary School at Tynecastle a range of 18 workshops has been erected in a two-storied building 406 feet long and 28 feet wide, with an adjoining wing on the west side 100 feet long. The height of the building is 33 feet, and the average floor space of each room 1,000 square feet.

The cost of erecting these buildings has been £6,000, which works out at the exceedingly low average of 3½d. per cubic foot; while the tools and fittings, with necessary electric motors, have entailed an expenditure of £2,020, making a total cost of £8,020.

The 18 rooms have been allocated as follows:—Engineers' and Brass-finishers' work, Tinsmiths' work, Moulders' work, Pattern-making, Cabinet-making, Carpentry and Joinery, Plumbers' work, Upholstery, Plaster work, Practical Science, Mechanical Drawing—one each; Cookery, 3, Laundry work, 2, Tailors' work, 2.

The school was opened in September, 1911, with 23 teachers, all highly skilled experts at their respective trades, and 391 pupils, embracing the following trades:—Engineers 116 pupils; Brassfinishers 20, Moulders 21, Tinsmiths 35, Cabinetmakers 21, Joiners 44, Plumbers 40, Plasterers 21, Upholsterers 11, Polishers 8, Tailors 22, Tailoresses, 32.

The winter attendance was very satisfactory, and the workshops were opened for a summer session of 11 weeks, the enrolment being 216.

It is the intention of the Board to erect suitable workshops in other parts of the city.

NUMBERS OF CLASSES AND TEACHERS.

The total number of classes in the Continuation Schools is as follows:—Div. I, 35; Literary English, 11; Commercial, 306; Technical, 74; Art, 20; Domestic, 288; Recreative, 87; total, 821.

There are 421 teachers employed in the Continuation Classes, 122 being trained certificated teachers. For the remaining 299 the Board arranged a course of 6 lectures on the art of teaching, illustrated by 4 practical demonstration lessons by their Master of Method. The attendance averaged 200.

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PERCENTAGE OF ATTENDANCE.

A very high percentage of attendance has always been a prominent feature in connection with the Continuation Classes, due to the regulations as to return of fee, to attendance and Burton prizes, to the close touch kept with parents and employers by head-teachers, to the interest pupils take in the work, and to the stimulating and practical nature of the teaching. The percentage of attendance for the ten years 1901-1910 has been (in round figures): 95, 95, 94, 94, 95, 95, 94, 93, 92, 90.

CO-ORDINATION WITH CENTRAL INSTITUTIONS.

There is a scheme of co-ordination between the Continuation Schools and the Heriot-Watt and Art Colleges. The general principle of the scheme is that the elementary instruction in English, Commercial, Technical and Art subjects should be given in the Continuation Schools, and that students who have successfully completed a two or three years' course, as the case may be, should be granted certificates based upon the results of class work and class examinations, as well as on attendance, qualifying them for admission to the Advanced or Specialized Classes in the corresponding department of the "Centrals." The standard of these certificates is maintained under the supervision of three Assessors appointed by the above Colleges and the School Board. So far as technical work is concerned, co-ordination is becoming a distinct success, but in art and commercial subjects results have not been quite so satisfactory.

METHODS OF ADVERTISING CLASSES.

The prospectus of the classes is issued in a joint form showing the relations between the Board's classes and the specialised classes of the Colleges, and a copy is sent to pupils who have left day school during the previous session. The arrangements for the session are also widely advertised by posters, handbills, window-bills and newspaper notices. Employers of labour are visited by the Organiser, meetings of workpeople are addressed by Members of the Board, and assistance is asked from clergymen, secretaries of trade societies and headmasters of day schools, in arousing interest in the classes and directing young people to take advantage of them.

Among the questions which now claim the attention of the Board are the following:—

(1) The best means of reaching the 7000 young persons in the city at present receiving no instruction.

(2) The provision of more suitable class-room and workshop accommodation for adolescents.

(3) The prevention of overlapping and waste by judicious schemes of co-ordination with the Central Institutions.

(4) Increased attention to the teaching of Citizenship and Physical Exercises.

- (5) The training of practical experts in the art of teaching.
- (6) Further co-operation with employers with a view to the institution of Day Continuation Classes.

SECTION 4: CENTRAL INSTITUTIONS.

The Central Institutions recognized by the Scotch Education Department and situated in the city of Edinburgh are:—(1) The Heriot-Watt College, (2) Edinburgh and East of Scotland College of Agriculture, (3) Edinburgh College of Art, (4) Edinburgh School of Cookery and Domestic Economy, (5) Royal (Dick) Veterinary College.

A scheme of co-ordination has existed since 1903-04 between the Continuation Classes and Secondary Schools, leading up to the Heriot-Watt and Art Colleges. It is hoped to have a scheme of Cookery and Domestic Economy brought in. By this co-operative plan the School Board secures expert advice of highly trained specialists employed in those Central Institutions, who visit the Continuation Classes not as inspectors but as advisers, to indicate such lines of work as will best connect with the more advanced college work. In the equipment of the workshops at Tynecastle the School Board had the benefit of the advice of the heads of those institutions, and by so arranging the work that it would not trench on the ground of the Heriot-Watt College, the public were satisfied that economy was kept carefully in mind.

The Continuation Classes provide only two sessions' instruction in English, Technical, Art or Commercial subjects, and pupils who receive certificates of qualification from their schools are thereafter expected to go forward to the more advanced stages of instruction in the Colleges. The assessors representing the "Centrals" and the Board have power to visit the schools from time to time and see papers set by teachers and samples of papers worked by pupils, and where qualified pupils have been readmitted to enquire into the reasons.

The Heriot-Watt College accepts School Board certificates in English and Carpentry and Joinery to admit to Intermediate Classes; those in Bookkeeping and business procedure to admit to specialized classes; and in Mechanical and Electrical Engineering, Building Construction, Printing and Plumbing as admitting to classes in those departments of the College which accept School Board certificates in Commercial Arithmetic and Commercial Geography as equivalent to their own in these subjects. It is arranged that Shorthand, Typewriting and elementary Geometrical Drawing be not taught in the Heriot-Watt College and that the School Board continue to make special arrangements for teaching these subjects.

The College of Art accepts School Art Course certificates to admit holders to their Art Classes, and Board certificates in Cabinet-making to admit to advanced classes in this subject.

A joint syllabus is issued showing the courses of instruction in the various subjects and the relation between the Board's Continuation Classes and the advanced classes in Heriot-Watt College.

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To encourage pupils to pass on from the Board's Continuation Schools to those Central Institutions, a private fund is distributed covering College fees, preference being given to pupils who hold certificates of proficiency from Continuation Schools. The Edinburgh Committee on Secondary Education has a scheme for enabling city students who have successfully completed a two or three years' course of study at Continuation Schools to obtain, by bursaries or otherwise, according to circumstances, education at any recognized Central Institution.

Evening classes are held in the Heriot-Watt College, the College of Art, and the College of Agriculture. In the latter the classes appeal especially to those engaged in rural industries in the neighborhood of Edinburg, in Factor's offices in the city or vicinity, in the seed trade, in nurseries, in gardens or forests or other branches of estate work, in dairying and in the meat and cattle trades. The classes in Botany and Zoology are of special interest to teachers, as they cover most of the ground of the ordinary Nature Study courses. A summer class in Nature Study beginning in April takes up the life history of typical flowering plants, influence of environment, etc., and typical vertebrates and invertebrates. In all the classes the work is made as practical as possible by means of laboratory work, demonstrations, examination of specimens, field work and visits to farms, woods, gardens and other places of interest.

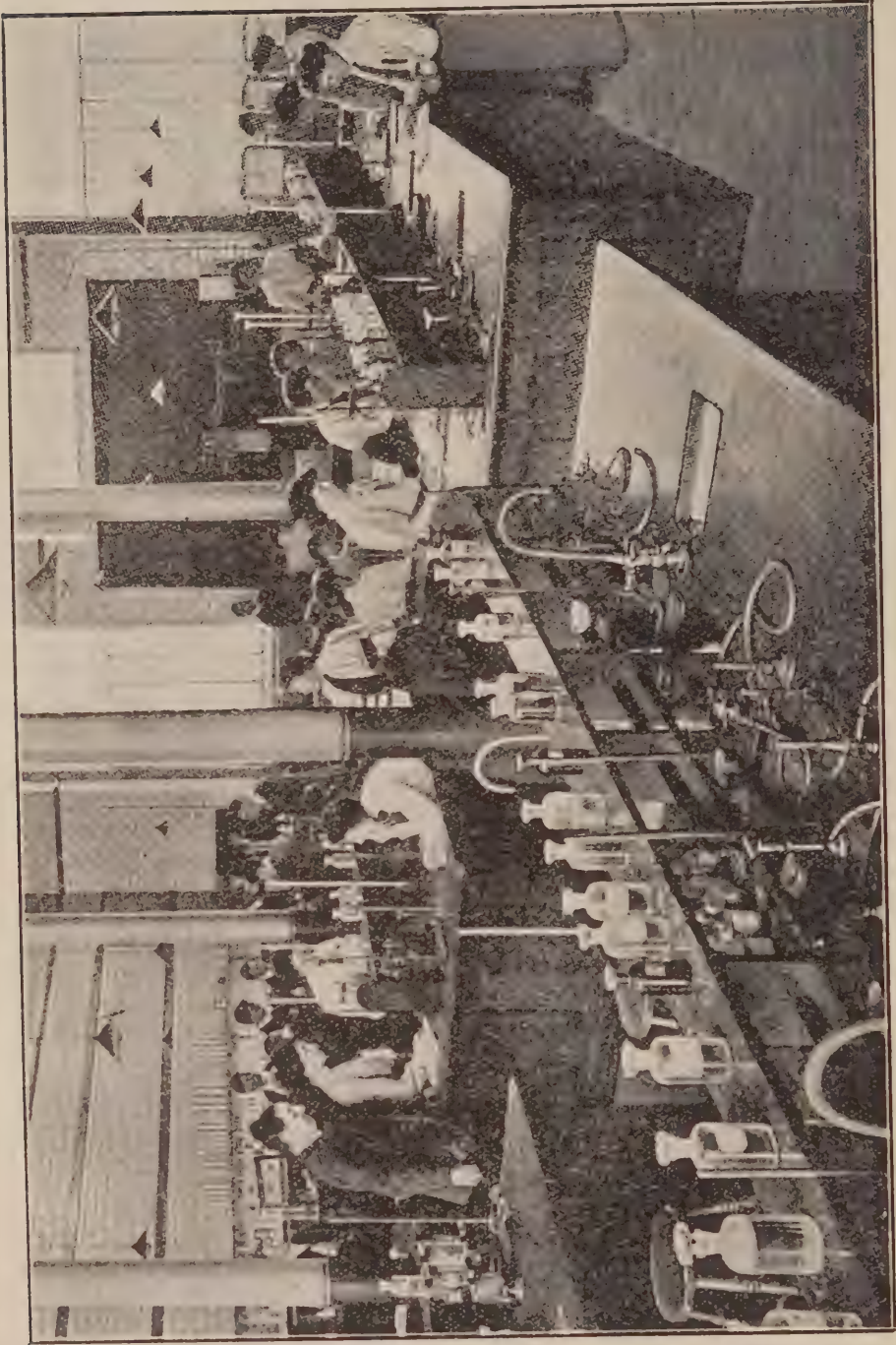
The scope of the several Central Institutions in Edinburgh recognized as such by the Scotch Education Department is as follows:—

(I) THE HERIOT-WATT COLLEGE.

This institution was founded in 1821, under the name of The School of Arts, its general object being the provision of classes to enable industrious tradesmen to become acquainted with such of the principles of Mechanics, Chemistry and such other branches of Science as were of practical application in their several trades. The two leading classes then established, which still continue to take the fundamental subjects of education in the College, were in Chemistry and Natural Philosophy. The name of the school was later changed to the Watt Institution and School of Arts, and finally, when the Governors of George Heriot's Trust took over the management in 1885, to the Heriot-Watt College. (George Heriot was jeweller and goldsmith to James VI, whom he accompanied when the Court was transferred to London in 1603.)

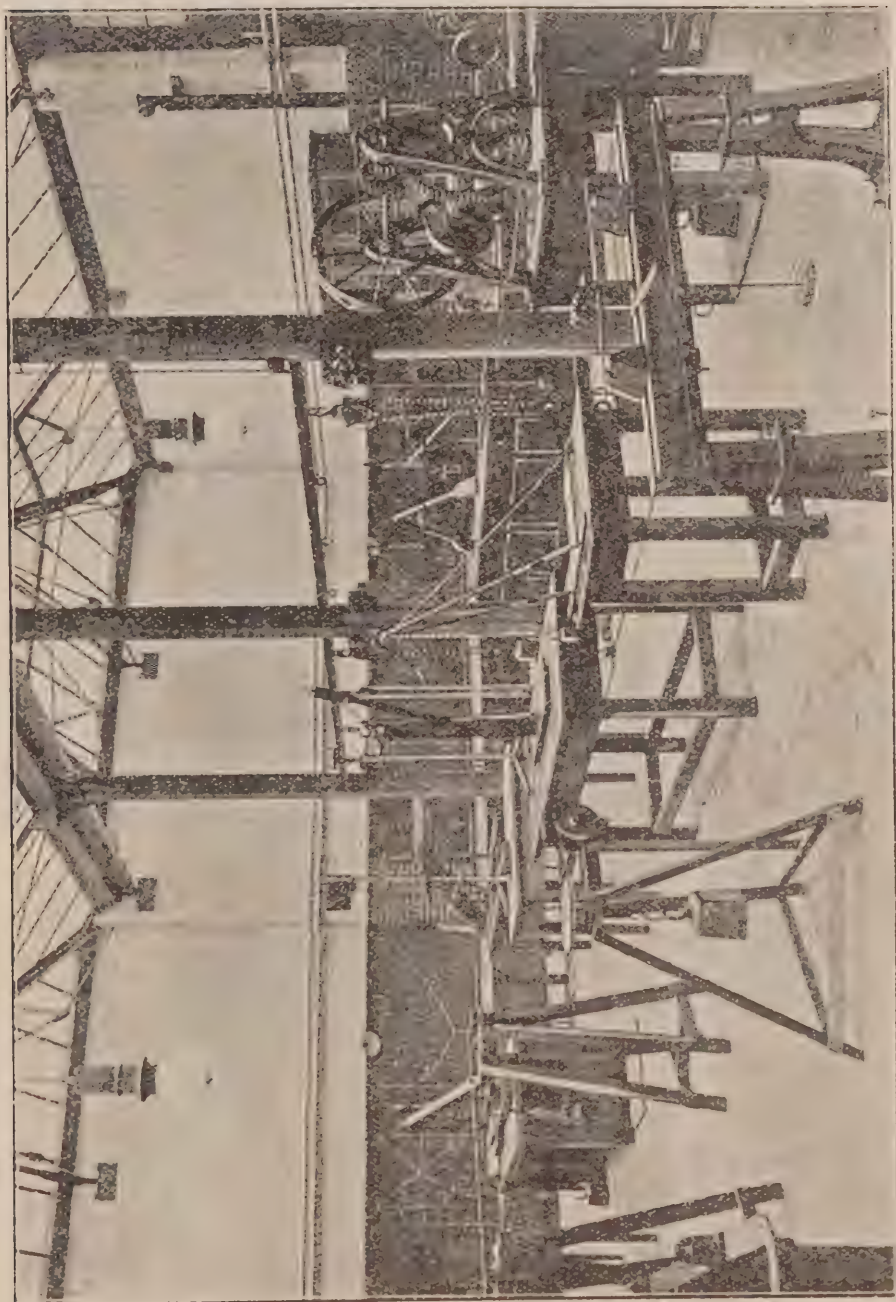
The curriculum has been greatly extended, and is now of much more general character than originally. The Day Classes, which preserve to a great extent the characteristics of the fundamental courses, aim chiefly at providing advanced technical instruction in the applied sciences of Engineering, Chemistry and Mining over at least a three years course; whilst Evening Classes include instruction in such subjects and also provide courses in those of a commercial or literary character.

The courses of instruction are co-ordinated above to the Engineering Department of the University and below to the Continuation Class System of the School Board.



HERIOT-WATT COLLEGE: PHYSICS LABORATORY.

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HERIOT-WATT COLLEGE. APPLIED MECHANICS LABORATORY.

The students number annually about 4,000.

The Continuation Classes conducted in this College are as follows:—

For those engaged in Engineering and Metal Trades:

- A. Elementary Engineering.
- B. Elementary Physics.
- C. Constructional Engineering.

For those engaged in the Building Trades:

- D. Elementary Building Construction.
- E. Plumbers' Work.

For those engaged in Wood-working and Furniture Trades:

- F. Carpentering and Joinery.
- G. Cabinet making.
- H. Upholstery.
- I. French Polishing.

For those engaged in Book-binding and Printing Trades:

- J. Printing.
- K. Bakery and Confectionery.
- L. Tailors' work.
- M. Plaster work.
- N. Brassfinishers' work.

MECHANICAL ENGINEERING COURSE.

(School Board Continuation Classes.)

I Year, II Year.—Geometrical Drawing, Practical Mathematics and Machine Drawing.

(Heriot-Watt College Classes.)

III Year.—Machine Drawing, 4 hrs. weekly. Practical Mathematics for artisans, 1 hr. weekly.

IV Year.—Electrical Engineering (Elem. 1 hr. weekly) and 1½ hrs. Laboratory work weekly (2nd half of Sess.)

V Year.—Prime Movers (Elem.) 1 hr. lecture, 1 hr. laboratory. Applied Mechanics (Elem.) 1 hr. lecture, 1 hr. laboratory weekly.

Similar Courses are arranged in all regular subjects. 1st and 2nd years are given in Continuation Centres of the Edinburgh School Board; 3rd 4th and 5th years are given in Heriot-Watt College.

(2) EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE.

This College was established in 1901. It is under the Scottish Education Department and entirely independent of the City, the Board of Governors representing County Councils. The building is provided with fully equipped laboratories and class rooms. In the day course a three years' study in the science and practice of agriculture is given; Horticulture and Forestry are also included. To meet the requirements of country districts, courses of lectures and experimental work are given at various stations in all the counties throughout the allotted area of influence of the College.

The College does not own a farm, but has 10 acres outside Edinburgh for experimental work. An organizer carries on experimental and advisory work, and at the same time organizes all other branches of agricultural activities in the districts. Most of the experiments are of the demonstration type on plots of from a quarter-acre to one acre. Farmers give up pieces of land for the purpose.

There are 28 Extension Lecturers who give their whole time attending markets and visiting the farmers regularly, but not teaching in Continuation Classes. The plan has worked out towards improvement. Farmers are evi-

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dencing their interest in the work, large farmers being extremely friendly. Farmers' Clubs give valuable suggestions, and Advisory Committees of practical agriculturalists meet and guide the College organizers as to experiments that can be taken up, bits of work that may be specially investigated, etc.

Under the direct supervision of the staff 128 School Gardens in connection with ordinary schools throughout the area of the College are conducted under regulations laid down by the College and adopted by the Scotch Education Department, which gives special grants to School Boards for these gardens. The College has regular farmers at these places, and there is a constant point of contact. There are no Evening Classes in connection with School Garden work, but Continuation Classes in scientific work are proposed, and, if established, will be correlated with School Gardens.

Two classes (in Perth and Fife) are held throughout the whole summer for teachers actually engaged in schools, and teachers-in-training also attend College twice a week for $2\frac{1}{2}$ hours each time.

The Scottish Agricultural Society works with the College, which advocates the co-operative sale of produce whenever possible.

There are about 475 students. Some qualify for the University diploma, and some for the B.S.A. degree. Fifty-two per cent of graduates go back to the land; the others are mostly teaching, lecturing, etc. In 1910 there were 114 Day and 287 Evening Students. In Edinburgh a good many legal offices connected with land—factorial work—send young fellows wanting insight into forestry, etc. Farmers near the town come in for veterinary work. Horticulture last year had 83 students, chiefly young gardeners engaged in the Royal Botanic Gardens in Edinburgh and at nurseries and private gardens round about. The work of the College is closely correlated to the Department of Agriculture in the University.

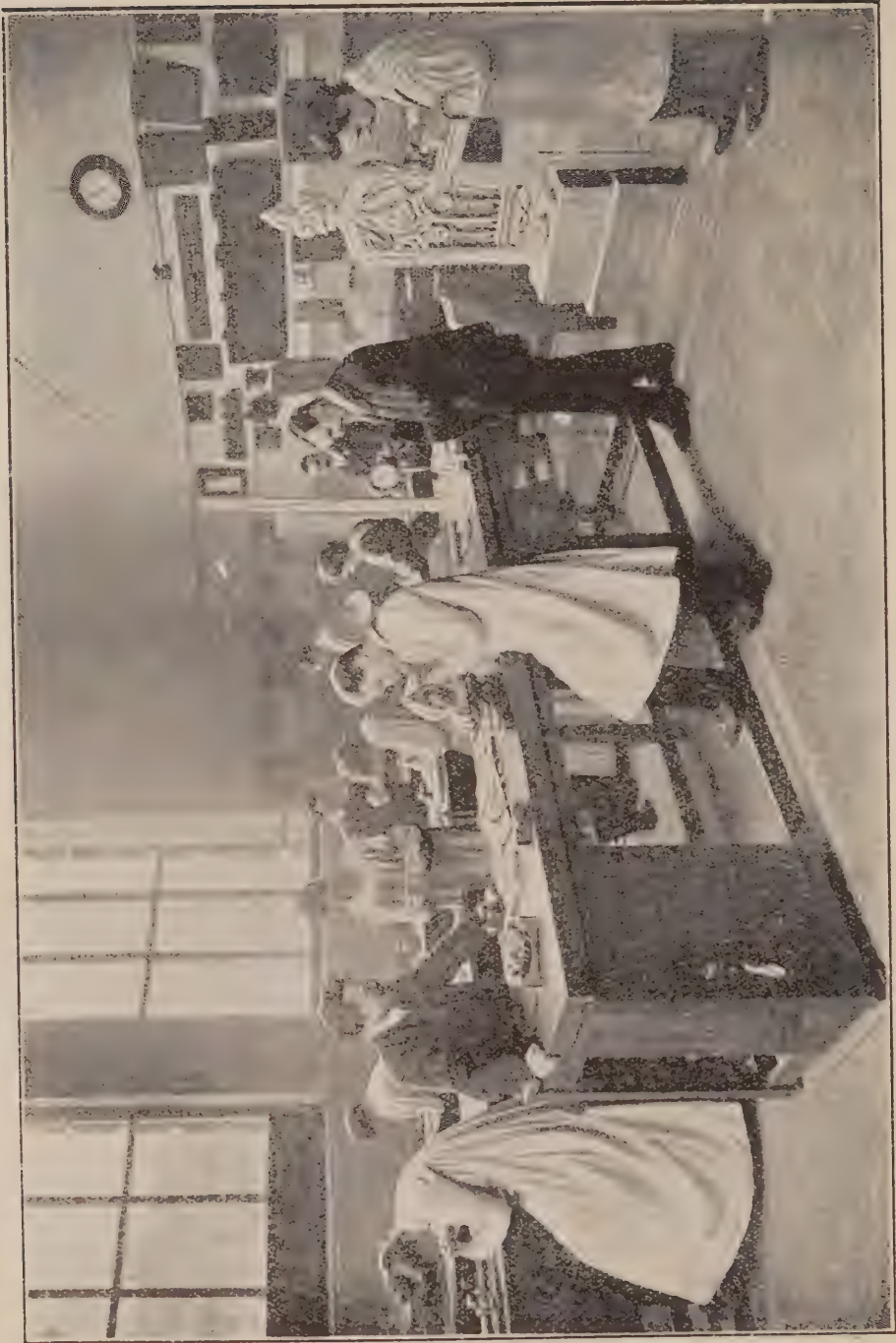
(3) EDINBURGH COLLEGE OF ART.

This College has recently been established by the amalgamation of several independent institutions which for many years carried on art instruction in the city. It is under the administration of the Town Council of Edinburgh, and a valuable relationship exists between it and the various Scottish Art Societies and Institutions. New buildings in Lauriston Place were opened in January, 1909, admirably suited for the work. A well organized system of departments in the various branches of Pure and Applied Art has been instituted.

The number of students (day and evening) is about 830.

About 150 lads in the painting and decorating trade attend 4 or 5 nights weekly in the dull season, and about 25 of these were selected for a special course in Drawing and Design. Employers pay their fees from November to March, and during that time they have instruction two days a week, for which time they are paid by employers. The Evening Class is entirely under the control of the employers and the Trades Union.

For trade work, both masters and men are represented on the Committee but do not control.



WOODCARVING CLASS IN COLLEGE OF ART.

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STONECARVING CLASS IN COLLEGE OF ART.

All architects' apprentices take two hours every morning in Designs a applied architecturally, and quite a number take all-day instruction, special students being selected for further instruction in Evening Classes.

Courses cover Industrial Art, Design, Artistic Crafts, as well as Fine Art. Special classes are held for teachers.

(4) EDINBURGH SCHOOL OF COOKERY AND DOMESTIC ECONOMY.

This institution provides instruction and issues certificates in Cookery (Plain and Upper-Class), Laundry work, Needlework, Dressmaking, Millinery, and other subjects allied to domestic economy. It also gives the necessary training for managers and for those who are to become teachers of these subjects, its certificates being recognized by the Scotch Education Department and the Board of Education in England.

A course has been specially organized for girls wishing to train for domestic service. They must be over 14, and must have gone through a preliminary training in the Supplementary Course. The instruction consists of six month's continuous training at this School and includes practical instruction in Cookery, Laundry-work, Housework, Sewing, Mending, etc. The fee, £11, covers the cost of material for a working dress to be made in the class, also provision of two meals a day in the school. The School keeps a register of students earning the Certificate from this course, and endeavors to find them suitable situations.

A Special "Housewife's Diploma" Course is offered, covering from 6 months to 2 years, according to subjects, the fee being £20, also a one year's course for Lady Housekeepers, fee £17. There is a course for Laundry Managers, 50 lessons, fee £6. 6s.

The co-ordination of the work of this school to that of the Continuation Classes of the Edinburgh School Board is under consideration.

The number of students attending the various courses and demonstrations in this institution averages about 3,000 annually.

(5) THE ROYAL (DICK) VETERINARY COLLEGE.

This College was founded by the late Professor Dick in 1823. Previous to that no institution devoted to the teaching of Veterinary Science existed in Scotland, nor was any Veterinary Degree obtainable in the country.

In 1827 the Highland and Agricultural Society, in co-operation with whom Professor Dick had acted in founding the College, appointed a Board of Examiners, who issued to successful students certificates of qualification to practise the Veterinary Art. Professor Dick on his death in 1866 endowed the Royal Veterinary College, hence it bears his name.

Up to 1906 the College was carried on by the Town Council of Edinburgh, as Professor Dick's Trustees, with the funds left by him, supplemented by students' fees and the income from the College practice, but it is now administered by a representative body of management.

The number of students is now about 100.

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(6) TRAINING COLLEGES FOR TEACHERS.

There are three of these institutions in the city, accommodating about 950 students in all, and serving the South and East of Scotland. They provide the general and professional education prescribed by the Education Department as necessary for the training of Primary and Secondary teachers. The course extends generally over two years, but allowance is made for time spent at the University or elsewhere in approved courses of general training of academic rank.

The work of the Colleges is closely related on the one hand to the preliminary instruction given in Secondary Schools and Junior Student Centres, and on the other to the curriculum of the Arts and Science faculties of the University.

The Colleges, formerly under the management of the Church of Scotland and the Free Church, are now united into one under the control of a public body known as the Provincial Committee for the Training of Teachers. A second still remains under the management of the Scottish Episcopal Church, and the third, the St. George's Training College for Secondary Teachers, is under the management of a Committee chosen from the subscribers to the College.

(7) EDINBURGH UNIVERSITY.

Although the youngest of the four Universities of Scotland, the University of Edinburgh annually enrolls the largest number of students, and has, in some respects, acquired a fame greater than any of the others.

Founded in 1581 on the historic site of "Kirk o' Field," the scene of Darnley's murder, it was opened for teaching in 1583 under the name of King James's College. Its origin is due to a bequest left to the Town Council by Bishop Reid of Orkney. In 1789 the original buildings had fallen into a state of disrepair, and the erection of the present stately buildings in South Bridge was commenced. The work was completed in 1828.

In 1869, owing to the great increase of students, it became necessary to provide more accommodation, and the University new buildings were subsequently erected. These buildings have been completed by the addition of the M'Ewan Hall, a gift to the city and University, which cost £115,000. Within recent years additional buildings have been provided by the establishment of the John Usher Institute of Public Health and by the erection of a new block at High School Yards for the Engineering Department.

There are six degree conferring faculties in the University constituted by recent ordinance,—Arts, Science, Divinity, Law, Medicine, and Music.

The number of matriculated students during the session 1908-9 was 3,286, distributed as follows: Arts, 1,157; Science, 300; Divinity, 64; Law, 305; Medicine, 1,440; Music, 20.

Women are admitted to degree examinations on the same conditions as men.

SECTION 5: CONVERSATION WITH MR. J. W. PECK.

Information obtained from "Conversation" with MR. J. W. PECK, Secretary to the School Board, Edinburgh.

Every year about 4,000 children, half boys and half girls, flow out from the schools, about 3,000 at one time and 1,000 at the other, and the Employment Bureau deals with them. When the date for leaving school approaches, the head-master fills out on a card the boy's educational qualifications, physique, adaptation, and what trade he would be suitable for. The parents also put on the card what they would like him to go into. The boys and girls are notified to go to the head office and get verbal advice on those things. Their going is optional, but tea parties are given at the schools, with all the parents present, and they are pressed very strongly to send the children along immediately they leave school and follow up the registration or personal interview with the authorities. The larger porportion of the 4,000 and their parents go, a certain number of nights weekly being set aside for these interviews.

Mr. McNally, the organizer of the Continuation Classes, deals with those matters. He advises the scholars and their parents as to what they are best suited for, and also what Continuation Classes they should follow if they are going in for a profession.

There is also an office in the Labor Exchange under the British Government system, and for the juvenile work the Exchange Officer sits in the room next to Mr. McNally. After the boy has fixed upon what he is best suited for, he passes on and definitely registers there for that occupation, and the Government officers keep all his record cards. The age is 14 plus a fraction, there being two fixed dates for leaving school.

The "forked road" in the selection of an occupation between professional and industrial life occurs in the school course about 12. The Labour Exchange Officer, who is in contact with all the employers of the city, looks up his cards and writes for the boy to come along. The boy may or may not get the job. It is a recent system, but it is working fairly well. Mr. McNally gives advice on (1) what the boy is suited for, (2) the industries of the city, and (3) the educational qualifications to keep up with them.

CONTINUATION CLASS SYSTEM.

The Continuation Class is a two-year system, from 12 or 13 onwards, for the more elementary side of industrial work. The more advanced side is given during the following three years at the Heriot-Watt College for engineering and mathematical work; at the College of Arts for art work; at the College of Domestic Science for cookery work; and at the College of Agriculture and the Veterinary College. There is no College of Music, thus leaving a gap in the system. There are three years of training sub-divided in these more highly specialized Colleges.

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Edinburgh suffers somewhat from the variety of managing bodies. The School Board manages the Continuation Class system; then the several Colleges are under the management of Governors. The Colleges wiped out their elementary Continuation Classes some time ago. When boys get to the top of the Public School system they pass on to the various Colleges, and the system is practically all one, as though one authority were managing it. The Colleges were quite glad to be relieved of their elementary work. The professors go around and see that the elementary teachers are working on lines co-ordinating with their own.

The Continuation System aims to cover education on four points:—(1) English: general development of power in speech and writing; (2) Citizenship, duties, privileges and responsibilities—they are all linked together in the organism; (3) Physical Exercise; (4) Actual Technical Training in various subjects, which follow pretty well the sub-division of the Colleges. The schools give, on a lower scale, what the colleges are giving on a higher, under a scheme of co-ordination whereby all the colleges relate their syllabuses to those of the Elementary Schools.

A CENSUS SURVEY.

Last summer a survey was made of all the industries; and houses of less than £30 rent were visited to ascertain what industry or occupation the young people therein between 14 and 18 were following. In this way a complete census was obtained of the juveniles and industries of the city. Where the census showed that a certain industry was asking for workers, and was not provided for in the educational scheme, a class was started. It is hoped to have a scheme of classes that will fit the condition disclosed by that industrial census.

HOW TEACHERS ARE SECURED.

The question of teachers is a very difficult point. Some are Day School teachers of ordinary subjects, such as Geography and History. Actual workers in the industries are employed as teachers of the technical work, as they know the practice of the shop and are familiar with all the processes; but they have the disadvantage of not being trained as teachers. Last year an effort was made to overcome this by a course of six weeks on methods of teaching, class discipline, how to interest pupils, etc., together with practical demonstrations by really good teachers, such as Professor Stanford, of the Heriot-Watt College, who gave a lesson on how to teach Engineering, all the Board teachers who were teaching Engineering being present.

Mr. Peck's opinion was that the advantages from the teachers being practical men compensated for their lack of training in teaching. He would rather take a practical worker and give him training in teaching than take a trained teacher and try to indoctrinate him in the Technology of Engineering. The workshop teachers had had experience as pupils in Evening Classes and would remember how they were taught. Professor Stanford goes round the Continuation Classes to see about the teaching.

The practical workers who teach in the Evening Classes are paid about 3s. 4d. (80 cts) an hour. At the head of each group of Evening Classes there is a Head Teacher, who is generally a man of experience in the Day School and is responsible for seeing that proper teaching methods are followed, details of registration properly carried out, etc. There are about 300 of these workshop teachers. It is proposed to give three lectures on general methods of teaching to the whole of them by the Master of Method from the Training College, then to follow that with three or four lectures to the various groups by recognised experts in those groups—lectures to Engineering men on the special way in which Engineering should be taught, etc. Then that would be followed up by sending those experts or subordinate experts to observe them in their classes and see if they were following out the methods they had been given in these two different kinds of lectures. It is hoped thus to rivet the whole thing together by concluding with lectures by the Master of Method.

STUDENTS AND EMPLOYERS.

The Continuation Classes are attended by about 10,000 pupils in winter and 3,000 in summer. In addition to the office work by the organizer of Continuation Classes and the officer of the Labor Exchange, series of meetings of employers are arranged. The employer gets all his work-people together, and the Education Office sends speakers to urge on them the advisability of entering the classes, the employers in some cases guaranteeing the fees. In that way a large number are brought in. Some eight years ago only about 3,000 were in these Classes, but by advertising, by employers' meetings, by getting at the parents, and by proving the caliber of the work, the number has been increased to 10,000, which is only about half the possible number. Mr. Peck did not know that they would get much higher than that figure, because of the inertia which could not be moved by even the most vigorous methods.

Re COMPULSORY ATTENDANCE.

Optional powers are given to Local Authorities under the Act of 1908 to pass by-laws requiring all young persons up to the age of 17 to attend Continuation Classes. Age limit, not educational attainment, is the basis of the legislation, just as in the Elementary School. One little Board in Haddingtonshire in 1909 passed a by-law under the Act, but it has not been followed up to any extent yet. Mr. Peck thought that compulsion up to the age of 14 does not give the authorities sufficient power or opportunity; and that specialization for industry before 14 is for such a very limited period that it must be of a very elementary kind. It was not real specialization at 14, but was just to interest the pupils in the application of their Arithmetic and Drawing to industries and arts, and did not carry out the work in the detailed way of the higher courses. He did not think the system which stopped at 14 could give a Technical Training such as the community required.

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SIX HOURS OF DAY-LIGHT TEACHING SUGGESTED.

He pointed out of the Act does not say that the classes must be Evening Classes but simply says "further education," leaving the Local Authorities free to specify Day Classes in their bylaw. If employers could be persuaded to let their employees off for Day Classes he thought it would be the better way. The Day Continuation Class work, he added, would have to be a part-time system. It would be a very serious revolution to take a large lump of day time out of industry. An improvement, if they could get the employers up to it, would be to take six hours weekly in daylight for Continuation Classes, instead of two hours on three nights weekly as now. Most of the members of the School Board, however, were timid about making this move. The initiation of the by-law is left to the School Board, which is subject to the will of the general ratepayers, who to some extent would be employers. The situation would be quite different if compulsory attendance were a statutory requirement. Where the School Board is elected it is more difficult to pass such a by-law. Of course if any large number of the ratepayers wanted it they would press for it at the triennial elections.

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ADVISORY COMMITTEES AND THEIR FUNCTIONS.

Advisory Committees, 18 in all, are made up for the groups of industries from employers, expert workmen and others interested in the industry. Their object is to see that the classes are kept in contact with industrial practice, and that the teachers are doing the work properly. They also advise the authorities as to whether they are guiding the pupils properly to the various industries; whether the various pamphlets issued by the Board about the industries are properly drawn up; and generally, they keep the Board right in regard to those matters. The members of those Advisory Committees attend meetings very regularly. The reports almost invariably say, "every member present." Each Committee has from 5 to 8 members. The Advisory Committees meet all together once a year and discuss things generally, and their suggestions are found very valuable and practicable. Those Committees are consulted about the workshops. For example, if the Board wanted to teach Tailoring, they could advise as to what sort of work should be taken up, what sort of men should be obtained as teachers, etc. He did not say the Board always accepted fully what the Committees suggested, because it has to deal with the educational side of the question. Out of the entire Advisory Council of 125 members, which is made up of the members of all the Advisory Committees, only 10 or 12 are educational experts.

CHAPTER XV: ORGANIZATION OF EDUCATION IN GLASGOW.

INTRODUCTORY.

Glasgow is organized for education on lines so similar to those given in detail for Edinburgh, that merely a summary and a few special features are given.

The School Board has 15 members and a Clerk; 12 Committees look after the various departments; and the Board has representatives on various educational and other bodies in the city, numbering 22 in all, including Central Institutions, Endowments Board, Committee on Secondary Education for the District, etc.

After experience with the new Education (Scotland) Act of 1908, the Board reports that while proceeding cautiously and, where possible, by way of experiment in regard to new questions, it continues to make steady progress in all departments of its work. It is establishing a systematic co-ordination of the various departments of educational work, and attempting to bring about the closest possible connection between the Day Schools and the Continuation Classes.

The experiment of establishing, in one of the Higher Grade Schools, a three years' course of instruction specially suited for the needs of pupils who intend to proceed to engineering or allied trades, and to continue their studies at the Evening Classes of the Technical College or other Central Institution, proved so successful that it has been extended.

The Continuation Classes are being developed with due regard to the needs of all members of the community; and, as fitting in an industrial city like Glasgow, special attention is being paid to the requirements of artisans. Further, in order to insure that every child under their care shall get at least the rudiments of a good elementary education, they have, under section 10 (3) of the Education (Scotland) Act, 1908, made by-laws compelling the attendance at Continuation Classes, until 17 years of age, of young persons beyond the age of 14 years within their district (1) who have not completed two years' attendance at a Supplementary Class or the equivalent thereof, (2) who are not otherwise receiving a suitable education, or (3) who are not especially exempted by the School Board from the operation of the by-laws.

SECTION 1: CONVERSATION WITH MR. J. CLARK.

Information obtained in "Conversation" with MR. J. CLARK, M. A., Clerk to the School Board of Glasgow, and with MR. FLEMING.

The School Board has very wide powers under the Act of 1908. There are fixed dates for the children to enter and leave school, these dates being chosen

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with the approval of the Central Authority, viz., 1st August, 1st February, or 1st April next after the child's 5th birthday; the leaving date being the corresponding one after the age of 14. From the time of entering to about 7 years of age, the child remains in the Infant Department; then from 7 to 12 there are five main stages. At 12 he passes the Qualifying Examination, and goes to either Secondary School work or to a Supplementary Class. The latter has an important bearing on industrial training. Many artisans are getting their training in the Evening Classes and proceeding to the Technical College or other Central Institution, where they take certificates and diplomas.

SELECTION OF VOCATION.

There is no distinction between Elementary and Secondary School work before 12 years of age.

At the age of 12 a notice is sent out to the parents, asking them which course they desire the child to follow. If a child is to leave at 14, since the Board has power to keep him at Evening Classes till 17, it is better for him to take the Supplementary Course and afterwards take his artisan or commercial training in the Evening Schools.

The integral difference between the two courses—the Supplementary Course and the course of the Secondary School—is that in the Supplementary Course no new ground is broken. Generally speaking, half the time is given to manual work; the boys have 5 hours Drawing and Manual Instruction, and the girls have Housekeeping, including Household Arithmetic and Keeping Accounts. They go out in turn to buy the provisions that are to be cooked for the day's work; and in addition, they have Dressmaking and other things.

If a boy had taken the Supplementary Course and then changed his mind, he would really require to go back to the beginning of the Higher Grade Course. Though he might go a little faster, he would be handicapped almost to the extent of the time he had spent in the Supplementary Course, but he would have lost nothing in his powers of observation and reasoning. He would not be so well equipped for the science side. A lad, after two years of Supplementary Class work and two years of Evening Class technical work, would be as well equipped for the particular kind of artisan work he was going to, as if he had had the three years' science course of the Intermediate Classes—in fact, a little more so. As a matter of fact, there are only very few cases of boys changing from one course to the other, chiefly because the schools are very fortunate in having the right men to advise the parents, so that only those who are quite sure of not being able to keep the boy at school after 14 are sent into the Supplementary Classes.

ATTITUDE OF EMPLOYERS.

Out of about 7,000 going out yearly, probably 2,000 pupils have not reached the Supplementary stage, but there is a by-law under the Education Act that they shall make it up before 16. The difficulty is that where the boys are working in factories and shops, the number of hours, including education,

must not exceed the limit stated in the Factory Act. Some employers are rather inclined to say that if there is any restriction as to the hours of labor, they will take nobody before 17; but others pay their apprentices sixpence a week additional for each certificate they get, so that some of these boys who would ordinarily be getting 10 shillings, are earning 14 shillings per week. One of the main objects of the by-law is to improve the attendance at Day-School, and in time people will realize that those who do not attend are so much handicapped in getting employment that the effort will be made to keep them at school till 14. Only those who do not attain a certain standard come under the by-law, and the parents begin to appreciate it already.

ADMISSIONS AND BURSARIES.

All the Science Classes in the whole of the West of Scotland are affiliated with the Technical College, and the students can get into the Technical College without examination on the certificate of the school.

The Burgh and County Committees have schemes of bursaries and maintenance allowances which enable the poorest lad in the district, if he has the necessary ability, to go on with those classes. The various industries are represented—engineering, drawing, building, naval architecture, coal mining, etc., and a scheme is being worked out on more elastic lines on the Commercial Education side at the Central Institution. The bursaries tend to keep the boys at home in the early stages, which is desirable, as the lower stages of the Technical College are overcrowded. By co-ordinating these local courses and accepting their certificates for admission to the Technical College, this is achieved. The particulars of the case of an applicant for a bursary are gone into in each case, and the nominating authority nominates on the basis of the certificates held by the students, while the personal evidence of the student is made an element.

CO-OPERATION WITH LABOR EXCHANGE.

The Technical College co-opts special members to decide along what lines special instruction should be given, and the Local Committees co-opt leading experts in various lines, all working in close conjunction with the Labor Exchange and the Advisory Committee consisting of representatives from all the education authorities, and from leading trades and industries and associations of industries. These can do what the Labor Exchange cannot do, viz., advise parents and boys what trades are overcrowded or unsuitable. Cards in duplicate are sent to the centres, one being filed at the School Board for Continuation Class purposes, the other filed at the Labor Exchange. These cards give information about the boy and some idea of what he is most fitted for. The Headmaster advises the boys when leaving to continue their education, and every case is visited so as to get them into the Continuation Schools. The Labor Exchange is not to relieve parents of their responsibility, but to help them. Special inducements are offered to boys

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to take courses rather than single subjects, by making it cheaper to do so. It is also proposed, instead of returning part of the fees for regular attendance, to admit to a second year's course, and to return the money at the end of that.

In Scotland the School Boards have a great deal of power in the matter of attendance, but Glasgow is the only big educational authority in Scotland which enforces the by-law about children in factories attending school, or even children working for their parents, or independently such as newsboys, etc. Every child has to be licensed for public purposes, and licenses are refused to those who do not attend school. While regularly constituted authorities have much power and responsibility, the Scotch system is essentially democratic.

ELEMENTARY EDUCATION.

The number of pupils for whom grants were paid during the school year 1910 was 69,886. Of these, 1,903 pupils, including 198 junior students, earned grants in the Higher Grade Departments and 67,963 in the Elementary Departments of the schools. The total amount of grant received from the Scotch Education Department, exclusive of the two High Schools, was £99,303, 6s. 11d., being £1. 8s. 3¼d. per pupil, for schools inspected on the work of 12 months, as against £94, 887, 7s. 2d., or £1. 7s. 6½d per pupil, in the previous year. This shows an increase of £4, 415. 19s. 9d. over all, and an increase of 8¾d. per head.

It is noted with satisfaction that enrolment in Supplementary Classes or in Higher Grade Departments was 5,735, as compared with 5,483 the previous year. The percentage of successes of pupils was 96.3, as against 97.7. In these classes and departments, 4,916 pupils received instruction, as compared with 4,406. Grants amounting to £8,185 10s. were paid on an average attendance of 3,146, as against £6,921 on an average of 2,676; and Merit Certificates were awarded to 1,618 pupils out of a total of 1,670 presented, as compared with 1,257 out of 1,279 in the previous year.

SECONDARY EDUCATION.

An increasing number of duly qualified pupils continue to take advantage of the higher education offered in the Secondary Schools of the Board. Care is taken at the date of each qualifying examination that parents are informed of the difference between Supplementary and Secondary Education, and warned as to the inadvisability of enrolling in a High School or a Higher Grade Department any pupil who is not to continue at school until he has obtained at least the Intermediate Certificate.

The three years' instruction, which constitutes the Intermediate Course, includes a systematic study of English and one or more languages, balanced by adequate instruction in Mathematics (including Arithmetic), Science, and Drawing. All specialization is postponed until the stage of the Intermediate Certificate has been reached. Thereafter, the pupils, while following a broad general curriculum, have an opportunity of varying their subjects of study according as they aim at an academic, a scientific, a technical, or a commercial career.

The Intermediate Certificate is accepted as qualifying pupils for admission to Schools of Art, Schools of Domestic Science, and certain other Central Institutions. This standard of attainment is also demanded of pupils entering on the Junior Student Course.

Pupils who have completed a post-intermediate course of three, or in some cases, two years, and have obtained the Leaving Certificate, are fully equipped to profit by University instruction, and a pass on the higher standard in any subject at the Leaving Certificate Examination is accepted as the equivalent of a pass in that subject at the University Preliminary Examination.

CONTINUATION CLASSES.

In the organisation of the Continuation Classes, the establishment of a close connection between day and evening school work, and the encouragement of a higher standard of general education are sought. The development of Supplementary Classes in the day school makes it possible to secure this. One function of the Continuation Classes is to make it possible for pupils who have completed the Elementary Day School course to broaden and extend their knowledge, and ultimately to specialise along the line of their practical work. Recognising this, the Board are gradually increasing the scope of their classes. In addition to the courses already in existence, English, Language, Commercial, Domestic, and Industrial courses have been arranged and all students who have not previously acquired a satisfactory knowledge of English must include that subject in their course.

Provision has been made under the Industrial Courses for artisans engaged in various trades to receive instruction in the principles underlying their occupations, and in workshop methods and processes, with such practice as may be necessary to supplement their workshop experience.

Attempts are also being made to stop the leakage between Day and Evening School in the case of those who left school before reaching the Supplementary Class. At each of the fixed dates, particulars of all children leaving school are obtained, and Attendance Officers are detailed to visit their homes, and endeavour to secure their enrolment in the Continuation Classes. So far this has not had an appreciable effect, but under the new by-laws the attendance of such children will be compulsory. The co-operation of the Employment Bureau of the Labor Exchange proves helpful in enabling the Board to trace such children as receive employment through the Exchange. Despite the leakage above referred to, there is a considerable increase in the number of pupils taking advantage of the classes for the completion of general elementary education, the total number being 3,588, as compared with 3,017 the previous session. In the more advanced classes for specialised instruction there is also a considerable increase, the numbers being 20,688, as against 18,506, the percentage of attendance being 80, as against 81.

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SECTION 2: A CENTRE FOR THE WEST OF SCOTLAND.

Glasgow is the centre for the Western Division comprising the Counties of Argyll, Ayr, Bute, Dumbarton, Dumfries, Kirkcudbright, Lanark, Renfrew, Wigtown. In this Western Division there were in the Session 1909-10, 435 Continuation Class Centres and 827 Continuation Classes.

As the result of a conference between the Glasgow and West of Scotland Technical College and the Glasgow School Board, these two bodies were persuaded to have a common system of organization in which the objective of the Continuation Classes conducted by the School Board should be the Technical College, and which would be beneficial to the pupils to the extent to which they carried it. Of course the co-ordination is a loose one; no rigidity is insisted on; but the Glasgow and Govan School Boards accepted the proposal, and now it has spread over practically the whole of the south-west of Scotland; so that classes in Kilmarnock, Dundurn, Paisley, Greenock, Hamilton, and many other places are all directly linked on to the Technical College, the scheme having been adopted by some 30 Boards in the Western Division and three from Stirlingshire.

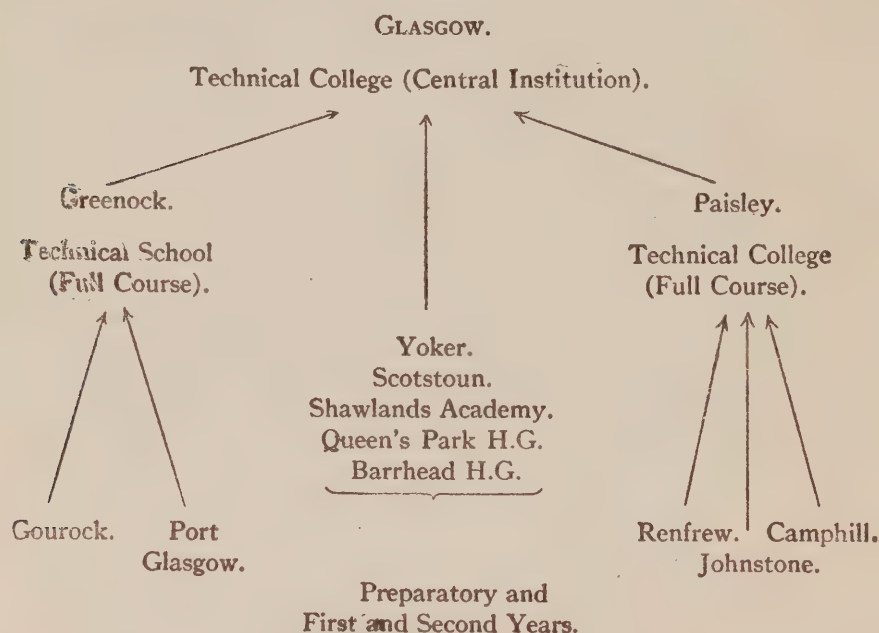
ORGANIZATION OF SCIENCE CLASSES.

This has raised the question of representation upon the Joint Committee on the organization of Science Classes, which could not be regarded as satisfactory unless every Educational Authority adopting the general scheme of work was represented on the Committee. The whole matter has now been considered and a readjustment made upon a fair basis. The Committee is now composed of:—

- (a) Four representatives of the Technical College.
- (b) Three representatives of the School Board of Glasgow.
- (c) Three representatives of the Govan Parish School Board.
- (d) One representative from each of five School Boards and one representative from the Govan Y. M. C. A.
- (e) One representative of each authority, excluding those mentioned, having an enrolment before the preceding September of not less than 150 individual students in affiliated classes.
- (f) The Organizing Secretary or Director of Education for any county containing affiliated centres, or a representative from the County Secondary Education Committee.
- (g) A representative of the Scotch Education Department.

PLAN OF TECHNICAL EDUCATION IN RENFREWSHIRE.

The following conspectus of Technical Courses in Renfrewshire will serve to show the arrangements made in that county.



EMPLOYERS' CO-OPERATION IN CONTINUATION CLASSES.

Public meetings have been held in a number of towns with a view of arousing a greater measure of interest in Continuation Classes and widening public opinion regarding their aims and possibilities. A Workers' Educational Association, representative of various Craftsmen's Societies, has been formed with branches and secretaries in certain districts through Glasgow, with the object of co-operating with the Board by impressing upon apprentices the benefits likely to accrue from attending a course of study having a direct bearing on their craft. Conferences have also taken place in several cases between employers and others interested in education, for the purpose of eliciting opinions on the selection and training of apprentices.

In response to a Circular issued to all employers in Glasgow and District, containing a series of questions, practically every one favoured co-operation, and promised to do all they could; some stipulating that the classes be held in the evenings. The questions dealt with the training of apprentices (a) before apprenticeship, (b) during apprenticeship.

Under (a) the great majority emphasize the importance of general education rather than technical, though specialization in mathematics and kindred subjects is favored by some. Under (b) specialization on the lines of the pupil's work

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is recommended, adequate instruction being given in Mathematics, Geometry, Drawing and Blue-prints. Some employers also express a desire for practical instruction of apprentices in their particular work.

On the whole, firms would give preference to boys prepared on the lines indicated; some however decline to do so. The bulk of employers would be willing to give every encouragement as regards promotion, etc. to apprentices in their works attending classes approved by them; some have already adopted this course. Others point out that owing to the trade rates of wages it would be difficult to grant increases.

Some employers offer to recoup apprentices' fees and expenses for materials, etc. or to promote good pupils to the drawing office by examination. All express willingness to co-operate with Education Authorities in promoting Trade Classes whose object is to produce more highly skilled workmen. They also promise to lend small equipment, such as patterns, tools, moulding boxes, etc. to classes in the district.

As regards the time for holding classes, about 80% of the firms maintain that work would be dislocated if the classes were held during the day. About 12% think that classes should not be altogether in the evening, while others express doubt, but will consider the matter. One firm suggests that boys should spend half the year at classes and half at the works. Even those firms, who consider that the classes should be in the evening, express readiness to co-operate with Education Authorities in arranging them at other times.

The majority of employers do not consider it advisable to have reports sent them on their apprentices' progress, only 37% answering in the affirmative.

GENERAL SUMMARY OF EMPLOYERS' OPINIONS.

The general opinion is in favour of:—

(1) Boys to stay at Day School till 16;

(2) Failing which, boys to attend Continuation Classes for subjects similar to those of the Day School, to be followed by a more technical course in Mathematics and Machine Drawing on entering their apprenticeship.

BURSARIES.

The Bursaries awarded by the Committee on Secondary Education for the District of the School Board of Glasgow are of three classes, viz:—

(a)—*Intermediate Bursaries*, granted to pupils from Elementary Schools or Departments, and tenable at an Intermediate or Secondary School for three years, from the beginning of the session subsequent to that in which the Qualifying Examination has been passed. A Bursar must take the full curriculum of the school for the Intermediate Certificate of the Scotch Education Department.

(b)—*Secondary Bursaries*, granted to pupils from Intermediate or Secondary Schools, and tenable at a Secondary School from the beginning of the session subsequent to that in which the Intermediate Certificate has been gained. A Bursar must take the full curriculum of the school for the Leaving Certificate, or for the Junior Student's Certificate.

(c)—*Central Institution Bursaries*, tenable at the following Institutions:—The Glasgow School of Art, Glasgow Athenæum (Commercial College), the Glasgow and West of Scotland Technical College, The West of Scotland Agricultural College, Glasgow Veterinary College, The Glasgow and West of Scotland College of Domestic Science.

A Central Institution Bursary is awarded for one session only, but a further application may thereafter be made to the Committee.

GENERAL CONDITIONS.

(1) The parents or guardians of applicants for Bursaries must be resident within the area of the School Board of Glasgow.

(2) The Bursaries are not awarded by examination, but the Committee will take into account the educational qualifications of the applicants as well as their need of financial assistance. The amount awarded will vary according to the circumstances of each case.

(3) The Bursaries will be paid only on a satisfactory report as to attendance, progress, and conduct being obtained from the Head Teacher.

(4) The Bursaries shall not be tenable with any other Scholarship or Bursary, unless in very exceptional circumstances, with the special approval of the Committee.

(5) On the award of a Bursary a form must be signed declaring that the Bursar intends to complete the relative curriculum course; in default of such completion, the return of the amount expended will be required.

Under the Glasgow Educational Endowments Boards, Bursary competitions were held in 1911 for University Bursaries. Three Bursaries of the annual value of £25, tenable for four years at the University of Glasgow, were awarded by competitive examination among those who had attended Public or State-aided Schools in Glasgow and required aid in obtaining a University education.

170 Bursaries were also awarded for Continuation Classes, 50 being for scholars whose previous education qualified them for attendance at Continuation Classes at Central Institutions, and the remainder for those already in attendance at such classes.

Candidates above the age of 17 are excluded from these competitions and the Bursaries are awarded strictly in the order of merit.

SECTION 3: CENTRAL INSTITUTIONS.

The Commission was impressed with the general good work done in Glasgow, as in other places in Scotland. In addition to the information obtained from conversations with Messrs. Clark, Fleming, Stockdale, Newbery, and other leaders, we give a brief survey of the Central Institutions.

The Glasgow and West of Scotland Technical College is fully covering the ground in the various branches of Engineering, Mining, Naval Architecture, Chemistry, Metallurgy, Building, Textile Manufacture, Mathematics and Physics. An account of the work of this college follows the "Conversation" with Dr. Stockdale.

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One Institution of particular interest is the Glasgow School of Art, which is featured under (4) of this Section.

Under the head of Central Institutions, brief outlines are given of the West of Scotland Agricultural College and the Glasgow Athenæum (Commercial College). These and the above, together with the Glasgow and West of Scotland College of Domestic Science and the Glasgow Veterinary College, form the Central Institutions for the district.

(I) GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.

Information obtained in "Conversation" with DR. H. F. STOCKDALE, F. R. S. E., Principal.

This College was established in 1796, and is therefore probably the oldest Technical College in the world. A class known as the Mechanics' class conducted under that old institution, which had the name of Andersonian College, called after the founder, Professor John Anderson, hived off from the parent institution and took to itself separate premises and management and called itself the "Mechanics' Institution". That was the beginning of these Institutions which under that name spread throughout the whole of Great Britain, and which have formed the beginnings of nine-tenths of the technical institutions of England.

In 1886 a Royal Commission which had to deal with the endowments of Scotland, and had large powers, brought together again the old Mechanics' Institution and the Andersonian College and some three or four or five other endowed bodies, and formed them into the "Glasgow and West of Scotland Technical College". These were brought bit by bit into one homogeneous institution, but the work of the College was conducted in three or four buildings scattered over the city. About ten years ago Glasgow raised a building fund of about £360,000, £80,000 of which came from the Government, the balance from voluntary subscriptions or grants from the city and other authorities. With that money the present magnificent building was erected.

REPRESENTATIVE BOARD OF GOVERNORS.

When the College was started with a new lease of life in 1886, the Commission placed it under a Board of Governors which consisted in the first place of certain Life-Governors representing old endowments which were then thrown into the common pool; and in addition to that they authorized the Lord Provost and Magistrates, the School Board, the University, the Trades House, the Merchants' House, Educational Endowments Boards, and public bodies of that kind, to appoint representatives for terms of years. With very slight modifications that Constitution holds good to-day, and these men are the governing body.

FREEDOM UNDER SCOTCH DEPARTMENT

In the old days the work was largely under the Science and Art Department of the English Board of Education, but about 12 years ago the power to give money for this work was transferred to the Scotch Board, and since then the

College has been in the hands of the Scotch Education Department whose general policy is to allow the utmost freedom in the development of the work. While the Department requires to be very fully informed about finances, proposals in regard to payment of staff, and a hundred and one things that make up the working machinery of the College, they have not interfered, and have had sense enough to see that those on the spot probably understand local problems better than they, and from the start they have done nothing but help those in charge.

DAY STUDENTS.

Shortly after the transfer of authority, the day work began to push ahead very strongly, until now there are 600 day pupils, more than half giving their whole time to College work, on which they enter with full University standing; but the standing of the diplomas of the College is not less than that of any British University. The other half of the students is variously made up. For example, a big shipbuilding firm has met with difficulty in regard to a particular oil, and they sent a competent man, a graduate in science, and put him in the laboratory to deal with that particular question. Though this man is not typical of the other 300, it is quite a common thing to find a man in a civil engineering office who is weak in surveying and wants to push ahead in that subject, and his employer will arrange to release him for a course in the College. Out of the 300 men there would probably be 150 graduates, who in the main attend the College to follow special courses adapted to their peculiar requirements.

The whole of the day work is of University standard, excepting the work of one little group—the Bakers.

EVENING CLASSES—GENERAL SECTION.

The Evening work is in two distinct sections. The large General Section is on a par with the day work as to standard, which is indicated by the fact that there are from 150 to 200 University graduates in the Evening Classes. Entrance upon this work is preceded by preliminary examination only in Mathematics in regard to non-engineering subjects; in engineering subjects a preliminary knowledge of Drawing is also required. This standard, which marks the beginning of the evening work in the main section, is the point at which students from Continuation Classes conducted by the School Boards around Glasgow enter, the latter having general courses leading to particular departments of the College under agreement with the College authorities, the work being regulated by a Joint Committee.

An officer of the College visits all the surrounding classes to see that the work is done in accordance with the agreement, that the syllabuses are correct, and that certificates are issued only to students who have satisfactorily done the work and reached a desirable standing. The volume of this work can be judged from the statement that every class of any importance, within 30 miles of Glasgow, is affiliated with the College, and that the numbers in these classes

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reach about 7,000, while there are within the College itself about 5,000; so that with the day students the College is the centre of organizations affecting about 13,000 or 14,000 students.

No work is done in the College of as low a grade as is done in these Supplementary Classes; there was an agreement that there should be a strict line of demarcation. The College had to send down to the Supplementary Classes hundreds of students, but the attendance has increased tenfold, and they are coming back very much better prepared than before, because they are giving very much more time to preparatory work. A boy, who has left the Elementary School at 14, has to go through a preparatory course of possibly two and usually three years before going to the College, so that there is good material with which to carry on the evening classes.

EVENING TRADE CLASSES.

The other side of the evening work is the Trade Classes, and to this problem the Governors are giving very serious attention. Dr. Stockdale said he could not say that a satisfactory solution of the problem had been found. The classes have grown bit by bit; the plumbing classes are the oldest, having existed for 30 years; sheet metal workers were the next, then the decorative trades, then printers, and thus bit by bit the College was led into the provision of a great deal of instruction which had no relation to the mass of the evening work.

The general tendency of the last Act of Parliament and of the policy of the Education Department of Scotland is towards putting all this trade work under the School Boards. The main work of the College is growing so much that something will have to be put out of it to allow for that legitimate growth, and Dr. Stockdale thought that almost inevitably it would be the Trade Classes.

SPECIAL INSTITUTION FOR TRADE CLASSES.

Personally he would like to see established a big separate institution which would provide for all the trades concerned in the work of the district, with relations to School Boards similar to those of this College, that new institution providing for the rank and file just as the College endeavors to provide for the higher ranks of the industrial world. This was Dr. Stockdale's personal view, and he added that what he said on this subject had not been considered by the Governors and adopted as their opinion.

He thought the College and its work were big enough as an administrative unit, and that if it grows any larger it cannot be properly looked after. He therefore personally deprecated the indefinite expansion of the work such as would follow a decision to retain and develop the Trade Classes within the College walls, as these could form a section which might well be dealt with separately. He thought that they would have to be in a building separate from the Continuation Classes, because of the necessary setting aside of workshops with very extensive and complete plant. At present the whole of the

basement of the College from end to end (350 ft.) with the exception of one room is given up to the Trade Classes. That type of student could not be got into the Day Classes, the Baking School being the only one in which, during the day, anything is done in the way of trade work. The ordinary operations which affect industry prevent men from coming in during the day, as they must earn their bread and butter.

It is not the intention of the Trade Classes of the College to teach a trade. The practical classes are open only to those who have had sufficient experience to profit by the class. In that way the Trades Union difficulty is met, and yet at the same time the classes are left open to those who have had workshop experience.

THE BAKING SCHOOL.

The College was approached a short time ago by the Master Bakers of Scotland with a request for help stating that, although the industry has become very important and a large number are engaged in it, very little is known about it from a scientific point of view. The College authorities agreed to do what they could, and the Master Bakers subscribed among themselves about £4,000 to equip rooms for the instruction of bakers. One of the Associates in Chemistry, who had also a practical knowledge of bakery, was put in as lecturer.

The Baking School forms a little world within a world, and is apart from the general working operation of the College. Ten or twelve men—mostly all sons of bakers—give their whole time to that work, and are looking forward to succeeding their fathers in business.

Probably the Baking School will always be treated differently from others, because the bakers of Scotland have made important sacrifices to establish it. They worked for many years, long before there was the present strong feeling in favour of education, and today the Master Bakers of Glasgow give the College over £100 a year and provide the material used in the Bakery School.

Dr. Stockdale said the way in which science could help the baking trade was very astonishing. He told of an extensive baker from Edinburgh who a few months ago came to the College saying that everything was going wrong—thousands of loaves being turned out every day that were practically unsaleable—and asked what could be done to help him. The College man, on investigating, found a colony of foreign bacteria in possession of his bakehouse. He told the baker what to do; and after he had done it everything was all right.

PRELIMINARY EXAMINATIONS.

There is no difference in the entrance standing between the Technical College and the University, though there is a difference in methods, and it is hoped that the changes made two years ago would simply anticipate the work of the Joint Committee of the Universities.

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The Joint Board of the Scottish Universities controls the examination for admission to them, and at present this College does not come under that, but will have to do so and adopt the same preliminary if and when the change in the University takes place.

One feature that must be kept in view is that the Secondary School system of Scotland terminates with the Leaving Certificate at the age of about 17, and Dr. Stockdale hoped that that Leaving Certificate would be accepted for matriculation without question in any faculty in any of the Universities. To all intents and purposes it is accepted now, but accepted for individual subjects; but he would like to see it accepted as a unit because, being the completion of the Secondary Education system, it would mark the entrance to the University.

In addition to the information obtained from "Conversation" with Dr. Stockdale, further particulars were learned by visiting the Institution and by examining its publications. The features of use to Canadians are mentioned hereafter.

EVENING CLASSES.

All students, except those afterwards exempted, who propose to enter the Evening Classes are required to pass an entrance examination in Mathematics.

Those who have obtained Course Certificates from any recognized Continuation School are admitted without further examination. The entrance examination is not required from students over 16 years of age proposing to enter classes in Music, Bacteriology, Biology, Geology, and Physiology, but they are expected to have received a good general education.

Students over 16 years of age joining Trade Classes are exempted from examination, but are strongly recommended to qualify for admission to classes related to their subject in other Departments of the College. The Trade classes are:—Textile Manufacture, Boilermaking, Decorative Trades, Plumbing, Sheet Metal Work, Bootmaking, Printing and Allied Trades, Watch and Clock-making, Breadmaking, Confectionery, and Tailoring.

Students must satisfy the Heads of the Departments in which they wish to attend classes that they are prepared to profit by the instruction provided. The Organizer of Continuation Classes in Science is present each evening to advise junior students joining the College for the first time. Advisers for the several courses of study leading to the College Certificate have been appointed, whom students are recommended to consult.

ENROLMENT OF STUDENTS.

The enrolment at the college in 1910 was as follows:—

	Intermediate Students	Class Enrolments.	Student-hours.
Day Classes.....	523	2,189	210,062
Evening Classes.....	4,944	9,038	328,416

OCCUPATIONS OF EVENING STUDENTS, SESSION 1909-1910.

Men.

Mechanical Engineers and Draughtsmen, and Structural Draughtsmen.....	1,329
Boilermakers, Ship Platers, Shipwrights, and Ship Carpenters. .	149
Foundry Managers, Blacksmiths, Brassfounders and Finishers, Moulders, Steel Smelters, and Roll Turners.....	52
Tin and Copper Smiths, and Sheet Metal Workers,.....	112
Civil and Mining Engineers, and the Mining Industries.....	314
Electrical Engineers and Draughtsmen, and Instrument Makers.....	186
Telegraphists, Telegraph and Telephone Mechanics,.....	143
Opticians and Watchmakers.....	60
Clerks, Travellers, and Civil Servants.....	304
Teachers.....	146
Architects, Measurers, and the Building Trades.....	677
Chemists, Gas Manufacturers, Druggists, Drysalts, Paper Makers, Dyers, Colour Makers, and Bleachers; Paint and Oil Trades.....	198
Printing and Allied Trades.....	141
Cabinetmaking and the Furnishing Trades.....	59
Textile Trades.....	66
Tailors.....	70
Bootmakers.....	57
Warehousemen and Salesmen.....	124
Bakers, Chefs, Cooks, Grocers, etc.....	399
Other Trades.....	32
No occupation, or occupation not stated.....	133
	<hr/> 4,751

Women.

Teachers.....	78
Chemists, Telegraphists, Clerks.....	19
Dressmakers, Milliners, etc.....	12
No occupation, or occupation not stated.....	84
	<hr/> 193
Total.....	<hr/> 4,944

(2) WEST OF SCOTLAND AGRICULTURAL COLLEGE.

During the Session of 1910-11 there were in attendance at Day Classes 111 individual students; at Evening Classes 111; at the Kilmarnock Dairy School 240. A steady annual increase since the College was opened in 1899 points

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to the urgent necessity of more accommodation. 54 students followed full consecutive courses for the Diploma or Associateship of the College. The regulations allow recognition of attendances at a rural course under the Provincial Committee to qualify *pro tanto* for the College diploma.

Extension Lectures in agricultural subjects have been delivered in 65 different towns and villages, and by arrangement with County Councils and other Local Authorities, classes with from 5 to 20 lessons in each have been conducted in Argyllshire at 10 centres, Dumfriesshire 17 centres, Lanarkshire 4, Ayrshire 5, Kircudbright 9, Perthshire 5, and 1 centre each in Renfrewshire, Wigtownshire and Stirlingshire. Dairy Extension work is also vigorously carried on.

Horticulture lectures have been delivered at 47 centres, and 55 School Gardens established in the different counties related to the College.

The Poultry Department has been strengthened by the appointment of a Lecturer, and Extension Lectures on Poultry Husbandry have been given in 26 centres.

A large number of *Demonstrations* have been given in different parts of the division of Woods and Forests.

Farmers engaged in *Cheese-making* continue to be supplied with pure cultures by the College.

The experiment of linking together related subjects to form a course has resulted in a greater number of students receiving systematic instruction.

(3) GLASGOW ATHENAEUM (COMMERCIAL COLLEGE).

The number of individual students in the Session 1910-11 was 1,402, the enrolments in the various classes being 2,758. At the close of the session 917 students presented themselves for examination, and the work done, as ascertained by independent examiners, is stated to be of a high standard.

The classes now number 128, the staff numbering 31 as against 13 five years ago.

Courses have been instituted in the Law of Shipping and Marine Insurance, Law relating to Railways, etc., the Money Market, Patterns, Designs and Trade Marks, special Day Classes being formed in order to encourage pupils from Secondary Schools to continue special studies before entering upon business. The result justified their continuation and extension.

The experiment of linking together related subjects to form a course has resulted in a greater number of students receiving systematic instruction.

Earnest consideration is being given to the question of co-ordinating the College work with that overtaken by School Boards.

(4) GLASGOW SCHOOL OF ART.

In Scotland the leaving certificates (Intermediate and Higher) are the meeting-points for school graduation, and the radiating points towards graduation in the professions. It is necessary to emphasize the facts: (1) that Drawing runs through the entire curriculum, the minimum time being $1\frac{1}{2}$ hours weekly

in the earlier stages, and 2 hours in the later; (2) that the Intermediate Certificate is granted on the results of inspection and examination at the medium age of 15, not for isolated subjects, but for a well-balanced course of study, including Drawing; (3) that it is not a final certificate, but a passport to higher study; and (4) that the higher Grade Certificate in Drawing is awarded to successful students on a minimum of two years' further study.

Higher art studies, as well as technical, are under the control of the Central Institutions, which include the Edinburgh College of Art, Glasgow School of Art, and Aberdeen (Gray's) School of Art. Committees of Central Institutions are composed of representative men, appointed from local bodies such as town councils, universities, school boards, trade societies, etc.

Universities have not been identified to any extent with Art teaching. In 1880 a Chair of Fine Art was founded in connection with Edinburgh University, but the functions of the Professor consist chiefly in giving an annual course of lectures, of which little advantage is taken. It is believed the time is not far distant when Art will be more closely associated with collegiate courses.

The certification of Art teachers, hitherto based entirely on the result of practical attainments, such as acceptance of works and personal examinations, will be conditional in future on the possession of the Intermediate Certificate; further study of general subjects of education, including Art, during a period of two years as Junior Student in training; and the diploma of a Central School of Art, covering a period of two, three, or four years. Attendance at a training centre for professional instruction in teaching methods, principles of education, etc., is also necessary.

Students preparing to be teachers of general subjects must obtain the Intermediate Art Certificate, succeeded normally by at least two years' study as Junior Students, during which it is expected that the Higher Grade certificate in Drawing will be obtained. Those who show special aptitude may be recognized as qualified to give instruction in Supplementary Courses.

ART RELATED TO INDUSTRIES.

More attention has recently been paid to the bearing of Art teaching on subjects relating to industries—their design, technique, and economic production. The satisfactory completion of a definite course in the Central Schools is attested by the award of the school diploma. The value of these diplomas is being increasingly recognized by employers and teaching bodies. Central and more important schools are equipped with craft rooms.

In view of the large number of occupations which do not call for extensive Art training, but in which Drawing forms a valuable adjunct, courses are provided which include Free Drawing and Technical Drawing, Geometry and Mensuration.

In Scotland the term "Free Drawing" includes what was formerly known as free-hand, model, and light and shade, with all their modern developments. Technical Drawing in this connection means the application of Drawing correlated to subjects of a technical nature.

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Scottish students have not hitherto enjoyed adequate opportunities for higher Art study, but the future looks much more promising.

The influence of Art Education on industries will manifest itself more apparently in the demand for good and tasteful products, than in the creation of Art objects; so many are users and so few producers. Hence instruction in Art matters must be a fundamental feature of the Art Education of the future. Sufficient time has not elapsed to demonstrate fully the effect on students and employers of the present system.

THE FUNCTIONS OF A SCHOOL OF ART.

Taking Glasgow and its School of Art as typical of most of the larger cities of the United Kingdom, the following is selected as an interesting statement embodying the views of Dr. Newbery, Principal, in reply to the question "What are the functions of a School of Art with special reference to craft classes?"

A craft class may be defined as a course of instruction in any special production to which Art is applicable, and in which the producer must be an Art workman. A craft class is really a trade class, for instruction in the nature and limitations of material. In the establishment of craft classes it should be taken for granted that the School of Art is a central institution for instruction in advanced Art, and that it is set down in the middle of an industrial population, whose chief work is the production of manufactured material or articles to which Art is applicable. Its objects then are,—

(1.) To supply to the utmost the needs of any and every local manufacture in which the application of Art plays any important part. This should be its chief work.

(2.) To aid in the resuscitation and revival of any Art industry which may once have been traditional, but which the pressure of commercial competition may have either thrust into the background or sapped of any vital life.

(3.) To endeavor to create new industries, provided always that the difficulties attending such creation be not insuperable.

GLASGOW INDUSTRIES REQUIRING ART.

(1.) Glasgow has a multitude of manufactures, but it is primarily a weaving town. It makes carpets, tapestry goods—such as curtains and hangings; cotton prints; muslin goods (particularly the harness variety); linen, damask, etc. But it prints wall-papers; it makes furniture; cast-iron work is a noticeable production; and there are one or two wrought-iron firms (one fairly good). It has a large trade in wood carving; it supplies architects with both wood and stone carvers; glass-staining is a noticeable, and more than locally appreciated art. The art of pottery is being taken seriously by at least one manufacturer. The city has silver-chasers, and jewellers' manufacturers, die sinkers, and commercial engravers. Lithography, though largely mercantile, employs many designers; there are the usual decorators' and painters' trades; mosaic and marble workers claim attention, and others, whose needs must be met.

Under (2.) comes needlework and embroidery, which in past time made Ayrshire famous, and an endeavour is being made to revive not only its acceptance, but also that of the art of lace-making.

Under (3.) comes the tentative effort being made, chiefly through the medium of the School of Art, coupled with a firm of well-known publishers, to afford work for women in the craft of book-binding and decoration; also to meet any possible demands that may be made by local gold and silversmiths for enamelling, and designs for gold and silver work and jewellery.

This list of the arts and crafts presents a fairly full budget for any School of Art to meet, but the demand may be taken as typical of most of the larger cities of the kingdom, with the exception, that in specialised centres, such as Birmingham, Sheffield, Manchester, or the Potteries, a local need bulks which simplifies and centralises craft work.

COURSES IN DESIGN AND DECORATION.

Guided by local conditions and demands, the Glasgow School of Art has the following courses in design and decoration:

Technical Studios have been specially erected to enable students to learn design in and through the use of material. To show the process of weaving, a loom has been erected and a practical weaver gives the demonstrations.

COURSES.

Principles of Design.—Lectures and demonstrations.

Applied Design.—Textiles—Carpets—Wall Papers—etc.

Stained Glass.—Design—Material—Technic—Preparations of Cartoons—Colour Schemes—Study of old examples—Drawing of Figure, Foliage and Ornament—Painting and Leading—Finished work.

Decorations of Interiors.—(Churches, Public and Private Buildings)—Drawing from the Cast—Drawing and Painting Flowers—Principles of Ornament—Architecture—Colour Schemes—Stencil Cutting—General application.

Needlework and Embroidery, Applique, &c.—Foliage in Outline—Study of Flowers from Nature—Design and Application—Technic—Study of old examples—Original work in Silk, Wools, and Linen.

Bookbinding and Decoration.—Outline from Cast—Foliage from Nature—Design to fill given spaces—Study of old examples—Tools and their uses—Material—Preparation and Execution of original design.

Ceramic Decoration, Design and Painting.—Outline from Cast and Foliage—Still Life—Painting—Modelling, Design, and application—Materials—Colours—Processes—Glazes—Firing.

Enamels.—Ornament—Figure—Life—Still Life—Design and Composition—Technic—Finished Work.

Mosaics.—(Same as above.)

Block Cutting and Printing in Colours.—Drawing and Shading Ornament from the Cast in line and wash—Antique—Life—Design and Figure Composition. Experiments in Printing will be made by a Printing Press.

Sgraffito and Gesso.—Drawing and Modelling Ornament from the Cast—Antique—Life—Architecture—Colour Schemes.

Design, Lithographic and Poster.—Ornament and Figure from the Cast—Life, Drawing and Painting—Design—Figure Composition—Colour Schemes and their application—Technic—Printing—Finished Works.

Metal Work—Gold, Silver, Brass, Copper and Iron.—Drawing Ornament and Figure from Casts—Design—Modelling—Ornament and the figure—Material—Technic—Repoussé Work—Chasing and Engraving—Original Work.

Wood Carving and Engraving.

Stone Carving.—Drawing and Modelling Ornament and Figure from the Cast—Life—Figure Composition Design—Copies of old work from examples and photographs; Original Designs.

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BEGINNINGS AND DEVELOPMENT.

The Glasgow School of Art was founded in 1840. In 1892 the Governing Body was made representative of the principal Public Bodies of the city, and the School was registered under the Companies' Act. In 1894 the Governors began to collect public subscriptions for the erection of a new building, part of which was formally opened in 1899. In that year the Scotch Education Department took over the control of the Science and Art Education of Scotland, and in September, 1901, the Glasgow School of Art was established as the Central Institution for Higher Art Education for Glasgow and the West of Scotland. In 1906 the growth and development of the School made the completion of the building a matter of necessity, and this was accomplished three years later.

The Governors are authorized to grant Diplomas and Certificates to students upon the results of a course of instruction, together with special tests. They bear the official endorsement of the Scotch Education Department, and are accepted by that Department as proofs of technical capacity.

The various Secondary Education Committees of the Country are empowered under the Education (Scotland) Act, to grant maintenance bursaries and maintenance scholarships to enable duly qualified students to obtain education in the Day and Evening Classes of the School of Art as a "Central Institution". Certain sections of the work of the School have been co-ordinated with that being done by the Glasgow Provincial Committee, the Technical College and the chief School Boards of the City and district.

RELATION OF ART SCHOOL TO PRIMARY SCHOOLS.

The scheme of Drawing studies agreed upon between the School of Art and the Glasgow School Board, intended to form a connecting link between the art work of the Primary School and the School of Art, has been accepted and put into working effect by at least a dozen other School Boards, so that their Continuation Classes in Drawing have been advantageously linked to the Evening Courses in the Central Institution.

An inspection of the work in the Continuation Classes of the second year results in a number of students being selected for further instruction in the School of Art. These classes are intended not only for students who desire to become painters, sculptors or designers, but also for those who wish to obtain a general knowledge of and practice in Art and the Artistic Crafts. Drawing classes generally are, however, disappointingly small. Notwithstanding every effort having been made, both by School Boards and by members of the Master Painters' Association, to bring before them the advantages of Art instruction, it is doubtful if more than 10% of the apprentices and journeymen have taken advantage of the facilities provided.

ENROLMENT OF STUDENTS.

The ordinary students in attendance (1910-11) at the various classes—day and evening—in the four Departments of the work of the School were as follows:—

Drawing and Painting.....	458
Design and Decorative Art.....	99
Modelling and Sculpture.....	41
Architecture.....	125
Total.....	723

CONVERSATION WITH MR. NEWBERY.

Information obtained in "Conversation" with MR. FRANCIS H. NEWBERY, A.R.C.A., Director of Glasgow School of Art, and MR. JOSEPH VAUGHAN, Superintendent of Art Instruction under the Glasgow School Board, and by a visit to the School of Art.

The Glasgow School of Art is a state institution managed by Governors elected from public bodies in Glasgow, the Education Department at London paying half the cost of maintenance. The efforts of the institution are devoted to raising the standard of Art throughout the length and breadth of the land. The attainment of this end is being achieved in no small measure through the work of the Elementary School teachers who come to this School for their training.

The School aims to make art applicable to industries. The object is to give people good taste and skill and power to apply good taste to the things they make, and to their own occupations. The School starts with the supposition that every boy and girl has an instinctive desire to express himself or herself in terms of Art. The point is to define exactly what is meant by Art. Mr. Newbery starts with the desire of the child to decorate itself, to surround itself with forms which are copies or impressions of what it sees, and he endeavours to make the child observe and study nature, and through this desire of decoration applied to itself or its surroundings to cultivate that side of beauty. It is a very simple proposition to recognize a certain power which the child possesses, and to deal entirely with that.

The old idea was that the school-master had so many homeopathic doses of Drawing to compound and count, throwing in stuff of no use to man or beast, and to serve that out to the children. The new idea is that Art students, like anybody else, have certain powers and instincts to be cultivated and directed. Mr. Newbery said the result had warranted the new point of view, and he believed there were now in the west of Scotland a large number of people teaching Art by endeavouring to develop this instinct in the child and directing its attention to the observation of nature from a purely artistic point of view. Between 800 and 900 teachers pass through the School every year. He believed that each of those teachers, in turn, is a missionary exercising an influence upon the children. Only by such education could they hope to get at the big thing called public taste, because the little children in the school are the future public.

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No distinction is made between the Art student who comes on Monday morning and works five days a week and the man or woman who comes on Saturday morning as a school teacher. The latter are not school teachers to the Director and his staff. The moment they enter the Art school they are Art students, and are submitted to the same Art influences of environment, instruction, direction, and any other that the staff can bring to bear upon them.

NEED OF EDUCATION IN TASTE.

Many evening class students work in Glasgow shops, but the problem here as elsewhere is this: Until the public can be brought to the point where good taste becomes national, if not universal, the designer works against odds, for the manufacturer is there to sell his goods to the public, and in plain English he sells them to people whose taste is worse than his own. Today 30 men and women are finding a living in Glasgow in Arts and Crafts who ten years ago could not get a foothold. They approach the public directly in the same way as the man who paints pictures. The girl working in a studio receives an order to make a piece of embroidery, to paint a picture, to make a piece of silver work or of repoussé work; she puts the taste into the article, and all over Glasgow the manufacturers' shops are filled with such articles for which this Art School is responsible. The people compare what they get this way with what the manufacturers of machine-mades sell, and have taken the view that this is the thing to produce. These Art works have developed a standard of taste. The school is turning out Art craftsmen, and slowly but surely the quality of the artistic needlework, pottery, silversmithing, etc., which the students are putting on the market is elevating public taste. It follows that in time the tone of machine-manufactured goods will be similarly elevated.

SHOULD SCHOOLS MANUFACTURE GOODS ?

The question of the manufacture of goods in schools for sale is a very involved one, the Director remarked, and one that neither this Art School nor any other can settle directly. Manufacturers in Glasgow pay rates to support the experts and others in the Art School, and if the School were to set the manufacturers against them, they would say, "We are not going to run this school in order that it may compete with our own works." They would not have a School of Art that was a factory. Therefore all the School had to do was to turn out designers seeking clients and customers. Mr. Newbery stated that in Germany last year he found exactly the same problem, together with others.

SCHOOL PRODUCES DESIGNERS, NOT DESIGNS.

Mr. Newbery believes that Art education should be far more general in its application; then graduates can go to a manufacturer and specialize in what they want. He told of a manufacturer coming from Paisley for a man to take the place of his foreman designer. The man turned out to be a very

big success and revolutionized the establishment, increasing the trade and making the whole thing smarter. As a matter of fact what he did when he got into that firm was to change almost entirely the style of design they were doing, and he 'got there' because he changed the style. "This School carries out a policy of its own in Art, producing designers, not designs, not subserving the needs of any particular industry. If a student is working towards, say, textile designing, his exercises are supervised by an expert from time to time, and any defects or features that are impracticable are pointed out; but the School does not have advice from anyone in trade as to what they think would be suitable for the School to do to meet their industrial conditions."

At the close of the term all the design students, who desire the School diploma, submit their works to a jury consisting of an artist, two designers, an architect and the best manufacturer who can be obtained, who is an expert on the manufacturing side.

ART AND PRACTICAL PROCESSES.

In pottery work the idea is that there is no preconceived design. It is not a question of having something made and then applying Art to it, but in the mere doing of it Art is the result. When such articles are taken into the home they exercise an influence, and people then want to buy something more of the same sort.

Pupils learn the colours very quickly, and like quiet colours—greys and blues, greens and purples. The pupils are kept away from floral forms, but the appearance of a flower can be made like small circles, and it does not take long to evolve floral forms from purely geometric forms. Pupils must be taught that embroidery is not painting, and that it will not do things that paint will do.

Twice a week a stained glass expert comes to the School of Art, and though he does not design he knows how to put a window in and tells about the lead-line, etc. The School is thus kept in touch with the technical requirements of the trade. The School eliminates the idea that the designing is done for any particular manufacturer, but the student at the school wants to express himself, does so in this way, and is kept right by experts. The putting in of lead lines must be endorsed by a man who knows the trade, else the design in stained glass may be like some designs in textiles—impossible of execution. The School endeavours to accept and carry out any demand that may be made upon a man to express himself.

REVIVAL OF ART NEEDLEWORK.

There is a general tendency to revive Art Needlework, but it has not yet been generally placed upon a good educational footing by relating it to discipline in Drawing and Design. The Inspector notes that it appears in some cases to be difficult to persuade teachers and pupils that pleasing designs can be produced with the needle even when the stitches used are of the simplest and most

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familiar character; but where this is once properly realized there is seldom any desire to return to the ordinary purchased design traced upon the material. With this craft, as with wood-carving and repoussé, systematic success can best be obtained when a close connection is maintained with the Art Classes of the School.

THE DORSET SMOCK.

A rather interesting experiment in educating the public taste is being carried on by Miss Macbeth, an Instructress in charge of Sewing and Embroidery. Director Newbery said that when he was a boy in Dorset, the "Dorset Smock" with its sewing and the artistic decorations of the dwelling were features of that countryside. The people who made those smocks never heard of the Art School in their lives, yet made extremely charming works of Art on traditional lines. So good was their work that when he could get hold of an old smock he bought it for the museum or Art School as a work of Art relative to the craft.

In sewing, as taught in this School of Art, school mistresses receive some practical illustration of the belief of Art teachers in the application of Art to the things of daily life. Hitherto they had been doing designs based upon floral forms, etc.; now they had evolved a scheme whereby, in the very act of joining two pieces of cloth together, the stitches were so arranged that they formed a kind of decoration, the result being a work of Art.

It is a long step forward if people can be brought to see that Art ensues by simply doing a thing in an artistic way, for they then begin to feel that Art is not something exterior to themselves, or a technique apart from themselves.

The child is a better artist at the end of the process just described than before, because the Art has developed outward—which all Art must do. Miss Macbeth said the children in the Kindergarten had been doing similar work in paper; now they do it in textiles; and it goes on logically from that.

The Continuation Classes use construction stitches to make Art garments—decorative construction all through. The first four stitches are the heavy stitches, the tacking stitch, top-sewing and herring-boning stitch. The child learns these stitches in the early stages. At seven years old it learns the plain stitch. Darning is begun as decoration. The principle is applied all the way through.

COLLABORATION WITH ARCHITECTS.

A life-size clay model was shown, and it was stated that one student made two full-sized figures in collaboration with an architect, and brought himself into touch with the actual requirements by working with the architect. Another student went recently to a new building in Glasgow and made figures for the doorway in keeping with the style of the place and the architect was so much struck with these pieces that he put them up. Architects come to the school and ask for things and get them for their buildings.

KEEPING IN TOUCH WITH THINGS OUTSIDE THE SCHOOL.

All the professors have studios in the School. They have three days on and three days off duty at the School; they keep alive in Art by touch with the outside world.

Mr. Newbery considers the Glasgow School the most practical Art institution in the world, its aim being to do the greatest good to the largest number. When a school is tied to a manufacturer it cannot do that, for the latter would not allow it, he being the biggest number. This school is concerned solely with being of the utmost utility from an educational point of view.

During the winter 478 teachers were in attendance ; in July another batch would be coming out of the glens and the Highlands, and in August still another batch. This is University Extension.

There is a set of lectures during the winter on related subjects—History of Art, Architecture, Sculpture, etc, because a student who is going out into the world to carry on a tradition ought to know the history of that tradition. Last year there was a brilliant set of lectures by University men on social and cultural subjects supplementing the History of Art, because it is absurd for a man to try to understand Greek Art unless he knows both Greek sculpture and the social conditions that produced that Art.

CHAPTER XVI: ORGANIZATION OF EDUCATION IN THE COUNTY OF FIFE.

INTRODUCTORY.

The Commission was informed that the organization and work in the County of Fife might be taken as representative and illustrative of much of the best that was being undertaken outside the large cities in Scotland. The County was visited and some of the more important features are reported upon.

The occupations followed in the County of Fife may be classed as purely Rural, Mining, Industrial, Commercial, Fishing and Housekeeping. These are in addition to the professional occupations usually followed among such people. Provision is made by the various School Boards and the County Education Committee to meet the educational needs of young persons for these several occupations. The School Boards make provision for Primary Education and Continuation Class work, particulars illustrative of which have already been given. In the towns there are Secondary Schools for general education which prepare for occupations or for entering colleges and universities. Under the Education Act of 1908 most of the Continuation Class work for Industrial or Technical Education, which was formerly under the County Education Committee, has come under the care of the several School Boards. A strong County Education Committee supplies specialist teachers (practically sublets them to local School Boards) for such subjects as Mining, Household Science and Industrial work where the school population of the locality does not require the whole of the time of such a specialist. These specialists circulate around a district and undertake their work in classes under a number of School Boards.

SECTION 1: CONTINUATION CLASSES.

Mr. James Mitchell, the enthusiastic and capable organizer of Continuation Classes, has the general supervision of the work under the County Education Committee of which he is Secretary. The following points were gleaned from conversation with him:—

Continuation Classes or Courses are provided for the chief occupations of the County, viz. Agriculture, Fishing, Mining, Engineering, Textile Manufactures, Commerce and Housekeeping.

For *Agriculture* there are not as yet any classes under Division III. Students who have gone as far as to be ready for such work go on to the Agricultural College at Edinburgh.

Nature Study is provided for at the Rural Schools.

There is a *Course for Teachers of Rural Schools*, continuing every Saturday during one school year. This course is given at Anstruther, where there is a

suitable School Garden. Such teachers receive an allowance to cover travelling expenses and while attending the course continuously, during the holiday period, they receive 15s per week living allowance.

Fishing. In the centres where a large proportion of the population follow fishing, the Nature Study in the Primary Schools is given with the needs of that occupation in mind. A special Fishery Course of 3 weeks' duration is provided for the fishermen at the Fishery Station at Aberdeen. Particulars of that are given under Schools for Fishermen. The County Education Committee name two or three men from each of the several fishing communities and pay their expenses while taking the three weeks' course. The fishermen appreciated the course very much and said they derived benefit from it. The information obtained by them was quickly and readily passed on to others who had not the advantage of attending the course.

For the *other occupations*, such as Mining, Engineering, Weaving or Textile Manufacture, Commerce and Housekeeping, Preparatory Classes are held at the small centres. Then the pupils go to larger centres for courses in Divisions II and III. On evidence of satisfactory progress, such pupils receive travelling expenses to these larger centres. After completing a course in Division III at one of these centres, the pupil may go on to the Evening Classes at one of the Central Institutions. Or when he completes the work in Division III, he may become a day pupil at one of the Central Institutions, and the way is open to him to proceed to what is practically the equivalent of a degree.

Mr. Mitchell considered the essentials in organization and effective maintenance of Continuation Classes to be as follows:—

1. An enlightened and energetic County Education Committee and like School Boards;
2. A capable and enthusiastic Organizer;
3. Competent, sympathetic and intelligent Teachers.

INSPECTOR'S REPORT ON CONTINUATION CLASSES.

Mr. J. C. Smith, His Majesty's Inspector for the district including the County of Fife, reports on the Continuation Class work in his district. The following points are selected as illustrative and suggestive for Canada.

For several years Fife had been very fairly provided with Continuation Classes—very fairly, that is, in comparison with most country districts in Scotland. But this was due in large measure to the activity and foresight of the County Committee. During the Session 1908-09 (in which is included the spring session as well) Continuation Classes were conducted at 69 separate centres, about half of which were under the management of the County Committee. Except in the larger towns—where the School Boards conducted classes in all Divisions—the distribution of management proceeded on this principle: that the County Committee should manage all Technical Classes, whether Industrial or Domestic—and, of course, the Domestic Classes had by far the largest enrolment—leaving to the School Boards the management of Division I, and of any literary subjects that might be desired; classes in commercial subjects were conducted by both authorities.

With the passing of the 1908 Act, the establishment of Continuation Classes became a statutory duty on School Boards, and the County Committee proceeded to divest itself of the management of its classes, except a few, that were considered to serve a wider area than was embraced by any single Board or practicable combination of Boards. This process, I may add, is now practically complete; the County Committee now retains only the management of the important Mining School at Cowdenbeath; and at the same time the classes formerly conducted

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by various local committees have all but one been absorbed by the School Boards. These transferences might have occasioned a partial collapse of the Continuation Class system, but for the fact that the County Committee had in its employ a considerable staff of expert teachers, whom they retained, sub-letting their services (so to speak) to the School Boards at less than cost price. Continuity was thus maintained, and the County Committee, though no longer managing these classes in the technical sense, still helped to control their organization in no small measure.

Provision is made for Rural Continuation Classes in a comparatively large number of villages in Fife. Lads of 14 to 17 employed on farms are urged to attend the day school in the afternoon for several days or for every day in the week. That can be done without serious inconvenience to anybody.

Urban Continuation Classes have been established all over the industrial area of Fife, and a very satisfactory Continuation Class system is said to exist in skeleton. The need now is to fill that up by large attendance of those in need of education.

PERCENTAGE OF ATTENDANCE.

As instances of the number of individual pupils who attend the Continuation Classes, the case of Dysart is cited, which, with some 3,500 pupils on the rolls of the day schools, has no fewer than 850 students enrolled in the Continuation Classes. In Kirkcaldy the proportion of Continuation Class students to the total number of boys and girls between 14 and 17 was estimated at 40% in 1910, as against 27% in 1909. In the case of Dunfermline, where there are from 1,200 to 1,300 boys and girls between the ages of 14 and 17, only 351 of these, or 28%, were enrolled in 1910 in Continuation Classes. The Inspector says:

What about the remaining 72%? That is the problem in a nutshell. The first thing is to bring home to people the fact that the problem exists, and what is its nature and extent. When we look at our fine Technical and Mining Schools we are apt to think that we are doing quite well. And so in a sense we are. For those adolescents who know what they want, for boys and girls who mean to get on in life, who have a definite ambition and want help in its pursuit, many of my Boards are doing very well indeed. But this class, as we have seen, amounts even in a favoured district only to 28% of the whole. What of the rest? Are we to let them drift? The attitude of many well-meaning people amounts in effect to that. "There is no demand for these classes," they say; and the classes in consequence are either not started or are soon abandoned. It is this attitude which we have first of all to combat. We have to impress on School Boards that their responsibility for the welfare of youth no longer ceases and determines at 14.

The first step, then, is to take a census of adolescents (14 to 17), showing their occupations, the Continuation Class (if any) that they are attending, and the stage of advancement they have reached when they left the day school. In my Day School Report I have shown that 50% of our pupils leave school without qualifying; of those who qualify, about one-third leave before getting the Merit Certificate. It will be found that the 28 per cent who attend Continuation Classes consist largely of those who have obtained the Merit Certificate in the day school. So much for the extent of the problem.

* * * *

In Dysart, on the other hand, we have a plain working-class population, no great variety of occupations, and no education tradition to speak of; the problem here is much harder, and the success correspondingly more laudable. One factor in this success has been the fact that all the Dysart Supplementary Courses and Qualifying Classes are centralised on Viewforth Public School, and that the head master of Viewforth Public School is also the organiser of Viewforth Continuation Classes. Hence most of the Dysart children are under his charge for a year or two in the day school, and can be headed towards the Continuation Classes. It is also possible so to frame the syllabus that Division I shall be identical *mutatis mutandis* with the first year of the Supplementary Course, and Preparatory Division III with the second. Pupils can thus be transferred from day to evening class at any fixed date. This continuity is symbolized, and the prejudice, which still hangs about Division I, avoided, by describing these classes as "Evening Supplementary Courses, Preparatory and Advanced." I regard this alignment of Supplementary Course and Continuation Class work as of great importance.

PRACTICAL MEASURES SUGGESTED.

A summary of the most hopeful practical measures to be taken, in the opinion of his Majesty's Inspector, are:—

1. A census of adolescents in each School Board area, with particulars as to occupation, Continuation Class, if any, attended, and the stage of advancement which they have reached before leaving the day school;

2. The appointment in each School Board area of a salaried Organizer, whose duty it will be to supervise the system of Continuation Classes. This official would co-operate with the County Organizer on the one hand, and with the employers and trade representatives on the other, to secure a system of classes that would meet the educational needs of the locality;

3. The alignment of the work of Division I and Preparatory Division III Classes with that of the Supplementary Courses;

4. The establishment of Information Bureaus at all suitable centres.

The Information Bureau is likely to be a useful ally to the Continuation Class work, especially in industrial districts with a wide variety of occupations. The prospect is more obscure in purely mining and purely agricultural districts, where there is a steady demand for labour of one kind, and most boys go straight to the pit or the plough tail. In this activity the School Boards will be obliged to co-operate with the employers of labour and with representatives of labour, and this, too, should react favorably upon the Continuation Class system.

SECTION 2: COWDENBEATH MINING SCHOOL.

The Fife County Committee joins with the Beath School Board in providing courses at the Fife Mining School, Cowdenbeath. This is the case in the County where the County Education Committee and the School Board manage courses jointly. In other cases the County Education Committee, through its organizing secretary and by subletting specialist teachers, co-operates with and assists the School Boards.

OBJECTS OF SCHOOL.

The School is established for the purpose of carrying out a liberal scheme of Technical Education in Mining and in the several branches of industry closely related thereto.

The organised courses of instruction are based on the requirements of Division III. of the Code of Regulations for Continuation Classes issued by the Scotch Education Department. Systematic courses extending over three or more years are provided, and in addition there is a Preparatory Course for those whose previous attainments do not fit them to enter at once with profit on the specialised work of their particular course.

The Laboratories are fitted in a thoroughly modern manner, and comprise:—

Chemical Laboratory.

Physical Laboratory.

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Mechanical and Strength of Materials Laboratory.
Hydraulics Laboratory.
Electrical Engineering Laboratory.
Mining Laboratory.

COURSES OF INSTRUCTION.

In accordance with the requirements of the Code of Regulations for Continuation Classes, the student must follow a definite course of instruction in subjects relating to and having a special bearing upon some particular trade or industry or occupation.

In compliance with these Regulations, and to provide for local requirements, courses of instruction have been arranged for under the following heads:—

1. *Mining.*
2. *Mechanical Engineering.*
3. *Electrical Engineering.*

Each part of any course must be taken up in an orderly manner, and single or disconnected subjects may be taken only after the express sanction of the Principal has been obtained.

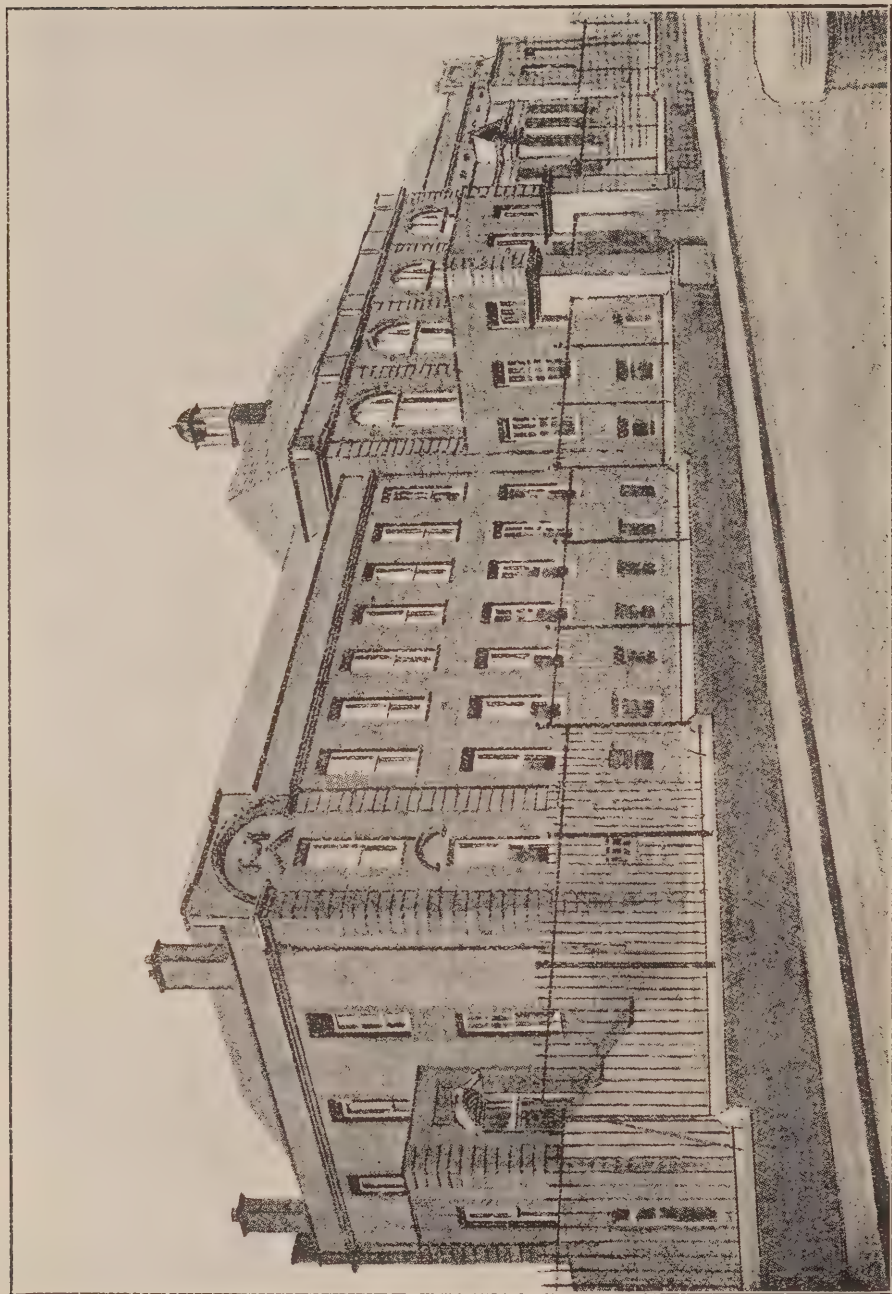
The School provides courses in Divisions I, II and III, as already described under the Continuation Classes, pages 664-5.

The equipment of the Mining School has been provided with particular regard to meeting the needs of those actually employed in and about the mines. The School itself had been in existence for about 16 years, although the new school building, where all the departments are now accommodated, was opened only a year before the visit of the Commission. Before the new building was provided the attendance at the Mining School was from 100 to 120. After the new building with its staff and equipment was provided, the increase in attendance was very large. During the Session 1910-1911 about 760 pupils were in attendance. Of these, 280 were taking the 5 years' course in Division III, 42 were colliery managers in actual service and taking a special course, and 440 were workers taking the more elementary courses. These were all evening courses.

CONDITIONS ON WHICH THE SCHOLARSHIP IS PAID.

Junior Scholarships or assisted railway fares are given freely to those who are qualified to profit by the courses and require such financial assistance. The following are the conditions on which the Scholarship is paid:—

1. The Scholarship is awarded conditional upon attendance at a course under Division III in all the prescribed subjects of that course for the particular year.
2. Application must be made on a form to be obtained from James Mitchell, Esq., F.E.I.S., County Buildings, Cupar, and must be in the Secretary's hands before 15th August.
3. Students must perform all their class work and exercises to the satisfaction of their teachers.
4. Students must make not less than 80 per cent of the possible attendances.
5. They must attend all Class Examinations, and also Official Examinations of the School at the close of the session.
6. Scholarships will be paid only to (a) unmarried men in receipt of a wage under 20s. per week; (b) married men in receipt of a wage under 40s. per week.
7. Distance travelled must be over two miles.
8. Scholarship will be paid in one instalment not later than 15th May in each year.



FIFE COUNTY COMMITTEE MINING SCHOOL AND BEATH HIGHER GRADE SCHOOL, COWDENBEATH, SCOTLAND, 1911.

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THE MINING COURSE.

The Mining Course continues during 5 years. Students who have completed a full course are admitted to the 5th winter session of the course held on Saturdays in the Heriot-Watt College, Edinburgh.

A Bursary is awarded of the annual value of £50, tenable for 3 years at the Heriot-Watt College, Edinburgh, or at a University approved by the Committee, and subject to a report of satisfactory conduct and progress of the bursar at the end of every session.

In Division II the following Special Courses are given:—

1. A Class forming a preparation for the Colliery Manager's Certificate.
2. A Class forming a preparation for the Under Manager's Certificate.
3. A Half-Session Course (Jan. to April) in Strength of Materials, for Colliery Managers.
4. A Half-Session Course (Sept. to Dec.) in the Examination of Mine Air, for Colliery Managers.
5. A Special Class in Electrical Engineering, for Colliery Officials.
6. A Class forming a preparation for the Fireman's Certificate.

For the convenience of men in official positions, who find Saturday afternoon the only free time during the week, a Class forming a preparation for the Colliery Manager's Certificate and another Class forming a preparation for the Under Manager's Certificate, meet on Saturdays from 4 to 6 P.M.

The curricula include: Coal Mines Act. Ventilation. Lighting. Sinking, fitting, and pumping. Haulage. Winding. Modes of working. Mine gases and coal dust. Strength of materials. Applications of electricity to mining. Surface arrangements. Surveying and levelling.

ORGANISED MINING COURSE

1. Preparatory Year's Course, comprising:—English, Arithmetic, Drawing, Mensuration, and Physics.
2. First Year's Course, comprising:—Applied Mathematics, Class I; Mining, Class I; Physics and Chemistry (Lecture and Laboratory work).
3. Second Year's Course, comprising:—Applied Mathematics, Class II; Mining, Class II; Mechanics and Steam, Class I (Lectures and Laboratory Course); Summer Class in Practical Surveying and Drawing, Class I.
4. Third Year's Course, comprising:—Applied Mathematics, Class III; Mining, Class III; Technical Electricity (Lectures and Laboratory Course); Summer Class in Surveying, Class II.
5. Fourth Year's Course, comprising:—Applied Mathematics, Class IV; Mining, Class IV; Mining Laboratory, Class I; Electrical Engineering (Direct Current), Lectures and Laboratory Course; Summer Class in Surveying and Levelling, Class III.
6. Fifth Year's Course, comprising:—Mining, Class V; Mining Laboratory, Class II; Mechanics and Steam, Class II (Lectures and Laboratory Course); Electrical Engineering (Alternating Currents), Lectures and Laboratory Course.
7. Saturday afternoon Classes at the Heriot-Watt College for students who have successfully passed through the above course. These Classes comprise:—
 1. Half-session course in the Mechanical Laboratory, making tests on engines, boilers, fans, etc. October to Christmas.
 2. Half-session course in Alternating Currents in the Electrical Laboratory. January to April.
 3. Series of Lectures on Mining throughout the session.

Arrangements have been made with the Local School Boards, whereby the student may take portions of the above course at the Board School, and the remaining portions that cannot be dealt with at the local centres, at the Mining School, Cowdenbeath.

Students working under these arrangements must be careful to complete the full course of each year before proceeding to the next year's course.

Students may take their classes in Mining and Mathematics of the first year of Division III at local centres, where such classes are held, and attend one evening each week at Cowdenbeath for Chemistry and Physics to complete their first year's course.

Similarly, Mining and Mathematics of the second year's course may be taken at the local class, and the student travel to Cowdenbeath for Mechanics and Steam to complete the second year's course.

ORGANIZED MECHANICAL ENGINEERING COURSE.

A course of class work and laboratory practice is given in this Department and continues during 4 years.

1. Preparatory Year's Course, comprising:—English, Arithmetic, Drawing, Mensuration, and Physics.
2. First Year's Course, comprising:—Applied Mathematics, Class I; Mechanics and Steam, Class I; Practical Geometry and Mechanical Drawing, Class I.
3. Second Year's Course, comprising:—Applied Mathematics, Class II; Mechanics and Steam, Class II; Mechanical Drawing, Class II.
4. Third Year's Course, comprising:—Applied Mathematics, Class III; Mechanical Drawing, Class III; Technical Electricity (Lectures and Laboratory Course).
5. Fourth Year's Course, comprising:—Mechanics and Steam, Class III; Electrical Engineering, Class I; Mechanical Drawing, Class IV.

ORGANIZED ELECTRICAL ENGINEERING COURSE.

A course of class work and laboratory practice is given in this Department and continues during 4 years.

1. Preparatory Year's Course, comprising:—English, Arithmetic, Drawing, Mensuration and Physics.
2. First Year's Course, comprising:—Applied Mathematics, Class I; Mechanics and Steam, Class I (Lecture and Laboratory Course); Physics and Chemistry (Lectures and Laboratory work).
3. Second Year's Course, comprising:—Applied Mathematics, Class II; Mechanical Drawing, Class I; Technical Electricity (Lectures and Laboratory Course).
4. Third Year's Course, comprising:—Applied Mathematics, Class III; Electrical Engineering (Direct Currents), Lectures and Laboratory Course; Electrical Machine Design, Class I.
5. Fourth Year's Course, comprising:—Applied Mathematics, Class IV; Electrical Engineering (Alternating Currents), Lecture and Laboratory Course; Electrical Machine Design, Class II.

CONTINUATION CLASSES.

Continuation Classes are conducted at 5 Board Schools of the Parish of Beath. These comprises courses of studies during 4 years, viz. Preparatory; Division I or First year; Division II or Second Year; and Division III or Third Year. In each year they are grouped as Commercial Course, Industrial Course, Household Management Course and Art Course.

Similar Continuation Courses are carried on at over 70 separate centres under the various School Boards within the County, not all of them carrying on all four kinds of classes or all four years of work. The classes or courses are arranged to meet the needs of the population served by the local School Board.

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As already mentioned, when a pupil has exhausted the opportunity in the small centre he may receive a bursary to enable him to attend the Classes at a larger centre, and so on to one of the Central Institutions.

SECTION 3: SPECIAL PROVISIONS AT DUNFERMLINE.

The town of Dunfermline, also in the County of Fife, has made full provision for Continuation Schools under the School Board, and these are co-ordinated or lead up to the Technical Classes in the Lauder Technical School.

THE LAUDER TECHNICAL SCHOOL.

This is a Secondary School with a Classical Side and a Modern Side. The equipment for classes in Mining and Weaving seemed particularly complete and appropriate. Evening Classes use the laboratories and equipment to a great extent. There were no day pupils attending the Weaving School up to the time the Commission visited the School.

The main building was a gift to his native city by Mr. Andrew Carnegie. It affords excellent provision for the Science and Art, as well as for Mining and other classes. It contains a fine suite of Art Rooms, including Elementary Drawing-room, Antique and Clay-Modelling rooms. There is a large Lecture Room, provided with every facility for lectures on science subjects; also Laboratories, in which students have the opportunity of practical work in Chemistry, Magnetism and Electricity, and Mining-Engineering, and rooms for the teaching of Mathematics, Building Construction, and such-like subjects. A large extension, handsomely equipped, in which electricity is utilized both for power and lighting, was opened in November 1910. Here excellent accommodation is provided for the departments of Weaving and Engineering. The suite of Weaving Rooms includes a Weaving Lecture-Room, a Laboratory for textile testing and analysis, and a large Weaving Shed, all furnished in a very complete and up-to-date manner. For the accommodation of the Engineering Classes, there are two rooms specially adapted for teaching Machine Constructing and Drawing, a large Mechanical Laboratory well supplied with testing and other machines, models, etc.; a Heat Laboratory, an Experimental Engine-Room, and an Iron-Workshop. There are also Laboratories for Electrical Engineering and Chemistry.

Excellent provision has been made, in alliance with the Carnegie Dunfermline Trust, for the teaching of Craft work related to various trades, in which artistic form and fitness of design are to be regarded as matters of primary importance. This includes work in Metal, Wood Carving, Modelling, Enamelling, Gilding, Repoussé Work, etc.

INFORMATION AND EMPLOYMENT BUREAU.

Dunfermline has a well-organized and active Educational Information and Employment Bureau. Its purposes may be stated as follows:—

- (1) To supply information with regard to the qualifications most required in the various occupations of the City and District, the rates of wages, and the conditions of employment.
- (2) To give information about the technical and commercial continuation classes having relation to particular trades and industries.
- (3) To advise parents regarding the occupations for which their sons and daughters are most fitted when they leave school.
- (4) To keep a record of vacancies intimated by employers, and to arrange for suitable candidates having an opportunity of applying for such vacancies.

Children can now leave school only at certain fixed dates, these being in Dunfermline 1st January, 1st April, 1st August, and 15th October.

It is proposed that a record shall be kept in the Bureau containing information on the following points regarding all boys and girls who leave school:—

- (1) A statement of Attendance and Behaviour.
- (2) Physique, Sight, Hearing.
- (3) Standard of Education attained.
- (4) Fitness for particular occupations.

To facilitate this work, the School Board provides cards, of which the following copy may be taken as an example. A different colour of card is used for each different school.

DUNFERMLINE (BURGH) SCHOOL BOARD.

EDUCATIONAL INFORMATION AND EMPLOYMENT BUREAU.

COMMERCIAL SCHOOL.

Name of pupil.....	Address.....
Date of birth.....	Date of leaving School.....
Standard of Education attained.....	
Attendance.....	Behaviour.....
Physique.....	Sight..... Hearing.....
Occupation desired (Parent to be consulted by Pupil).....	
Opinion of Headmaster and Teacher as to kinds of Occupation Pupil is fitted for by natural bent and educational equipment.....	
In what Evening Classes does Pupil propose to enrol, and for what Course of Instruction?.....	
.....Headmaster.	

NOTE.—Remarks by Teacher or Headmaster should be entered on back of card.
This card to be sent to School Board Office, 104 High Street.

CARNEGIE DUNFERMLINE TRUST.

Dunfermline is fortunate in having many educational advantages and opportunities provided or assisted by Mr. Andrew Carnegie, whose birthplace it is.

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For Dunfermline proper, the *Carnegie Dunfermline Trust* practically pays 3 doctors, one dentist and 2 nurses in connection with the health work for the public schools. Two of the doctors do also some work in teaching, and in the training of teachers who are taking the courses of Physical Culture and Hygiene at the Institute. The Trust also pays the salary of the Drawing teacher who visits the several schools. Bath premises, with finely appointed conveniences, have been provided; for the use of these small fees are charged, and the Trust provides the sum of about \$15,000 per annum for maintenance, above the amount received from fees. In the old bath premises, which preceded the more commodious and beautiful ones at present in use, the baths are free at certain times under regulations, and provision is made there for a free medical and dental clinic. In brief, the Carnegie Dunfermline Trust is doing exploratory and experimental work to shed light on social and educational problems, as well as to benefit immediately the children and people of the town.

COLLEGE OF HYGIENE AND PHYSICAL TRAINING.

This institution gives a course of training extending over two years, which, in conjunction with the professional course of training in teaching provided by the Provincial Committee, prepares students to become teachers of Physical Training and Hygiene in schools. During the Session of 1909-10 the total number of students was 44, of whom 16 were men. Five men and 16 women completed the course and were awarded the diploma of the College.

VACATION CLASSES.

St. Andrews' Provincial Committee, in co-operation with the Fife County Committee, arrange for the further instruction of teachers by Vacation Classes held at 6 centres within the County. These provide for ordinary certificated teachers, teachers of Physical Training, Manual Instruction, Cookery, Plain Sewing and Cutting Out.

CHAPTER XVII: GALASHIELS AND HAWICK.

SECTION 1: HAWICK.

Hawick is an ancient Burgh with a present population of about 17,000 people. The chief industries are the manufacture of Scotch tweeds and woollen hosiery. A walk against the workpeople, leaving the mills at the close of the day, revealed a working population of healthy appearance, vigorous physique, neatly dressed, quiet in manner and apparently contented and happy. There was no evidence of dissipation. Men and women alike were smart and intelligent looking.

One learnt that many of the solid neat-looking houses where these people live were built through the aid of a Building Society. Numbers of these were semi-detached stone cottages costing from £350 to £400 per house. The payments necessary to enable the occupant, for whom the house was built, to own it outright had been about 6% per annum on the cost of the house for a period of 20 years or rather more. Such payments gave a member of the Building Society a full title to the house at the end of the 20 or more years. Tenement buildings had been built on a similar basis but costing less per house. Such tenement houses with kitchen, living room and bedroom could be rented for from £8 to £12 per annum.

In the newer areas of the town the houses had neat well-kept gardens in front, and the workers had garden plots for vegetables at some distance from their dwellings. There were over 400 such plots of 1-10 of an acre each. The abundance of flowers and their beauty had made this an industrial "garden city" before that name was technically appropriated by a new movement. These facts are mentioned, because some at least of the fathers of the town in conversations attributed them in large measure to the education and educational influences of the place.

CONTINUATION CLASSES.

Hawick School Board provides Evening Continuation Classes for the further education of young men and women after the Elementary School has been passed. In the announcement of these classes the Clerk to the School Board says:

Boys and girls on leaving school, soon forget much that they have learned if they do not seek to extend and at the same time fix in their minds the knowledge already gained. It is therefore especially desirable that parents should see the importance of their children attending these classes and should do everything in their power to further such attendance.

The training of adolescents is now regarded as one of the most important developments in the educational system. It is at this stage that the moulding of character is effected. Much of the future prosperity of the youth depends upon the manner in which he spends these years.

Increased knowledge is assuredly the best preparation for an honourable and profitable employment; and the formation of habits of study, and the consequent acquirement of higher tastes and ideals, are a safeguard against temptation to idleness and evil-doing. Therefore let the youth of the town be encouraged to spend their evenings profitably at these classes, which are conducted by capable teachers in as interesting and instructive a manner as possible.

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The Continuation Classes are carried on in a manner somewhat similar to those described at length at Edinburgh. Division I has preparatory courses; Divisions II and III provide specialized courses arranged in no less than 37 classes providing courses of work for (a) engineers, (b) joiners, (c) masons, (d) plumbers (e) commercial workers, (f) art students and (g) domestic occupations. The classes themselves, beginning with English, provide also for Latin, French and German and furnish systematic training for each of the groups of workers.

In conversation one of the teachers expressed the opinion that it was desirable that pupils from these Supplementary Classes should be sent or taken frequently to the more advanced technical classes held at the Hawick Technical Institute in order to interest them in the provision which exists for further education.

SUCCESSFUL EVENING CLASSES.

In "Conversations" with members of the School Board it was learned that the Board relies a good deal upon the Consultative Committee in the arrangement of the classes. The attendance has grown up chiefly during the last eight or nine years since they have become more attractive by adaptation to the occupations of the young people. They are now attended by 853 individuals.

It is claimed that the evening classes, instead of exhausting the young people, have a recreational and exhilarating influence because of the different kinds of activity from those followed during the day. The development of more taste and more thinking on the part of the pupils is claimed to be an excellent result. The attendance after the classes are opened is so well maintained, after the first month, that 90% of the whole number have their fees returned by making 80% of the total possible attendances. It was observed that the attendance at the Evening Classes was about 5% of the total population of the place. That is a tribute to the wisdom of the people, the effectiveness of the administration and the capability and enthusiasm of the teachers. After learning the character and extent of the educational work done, one has no cause to wonder at the wholesome bearing of the people and the beautiful appearance of their sturdy Burgh.

HAWICK TECHNICAL INSTITUTE.

The following information was gathered from "Conversation" with Mr. William Davis, M.A., the Principal, who is also Director of Textile Technology under the Education Authorities of Carlisle and Dumfries.

The Institute was brought into existence to train operators employed in the two staple local industries, viz: woollen cloth manufacture and the production of knitted fabrics. The classes are held, from September to May, each evening from 7 to 10 p.m., and are keenly taken advantage of by the young men employed in these industries. This has been more particularly the case during the last two sessions since all departments were provided with a full equipment of practical apparatus. This has, in fact, given the cause of technical education for this district such an impetus that Mr. Davis would strongly recommend any new classes to have the apparatus installed the first session.

Generally speaking the students of any one department meet two evenings per week, one being devoted to lecture work for about one hour and the other given to practical work for about two hours. When the classes started considerable difficulty was experienced in obtaining teachers qualified so as to be recognised by the Education Department. Though practical men who had but little previous experience in teaching, or lecturers who had but little practical experience, could be obtained with comparatively little difficulty, the two accomplishments were rarely found together. The method now is to appoint a lecturer who can be recognised by the Department, and then have a practical man to take charge of the apparatus. When the classes have been in existence for some years promising students come forward, and after obtaining their diploma, qualify to act on the Staff.

For the past seven years Mr. Davis has been engaged in developing textile technical instruction in various parts of Scotland and England. For several years he went to a neighbouring district near Hawick until a young man qualified who could be left in charge of the classes. Other places were taken up in the same way and young men are now qualifying to establish such classes permanently. In three years' time all such towns will have a textile department established under their own local teachers.

TRAINING WOMEN WORKERS.

Last session the Institute took up the question of training the women workers in local industries, and introduced classes for repairing the imperfections of woven textiles. The experiments proved an unqualified success; 25 students attended two evenings per week with the utmost regularity, and showed the keenest interest and enthusiasm. As a result of this instruction the manufacturers have been able to considerably shorten the period of apprenticeship necessary to learn this branch of work. The work of this Department has attracted the attention of the neighboring towns of Galashiels and Selkirk, which are now starting similar classes in their Institutes.

Similar sections exist in connection with the knitting department, where a number of students devote their time to the structure of the various stitches of the knitted loop and learn how to repair such fabrics. The difficulty about teachers for such departments is not so great as with the other sections, for the work partakes more of a practical character, and the general supervision of a technologist is all that is needed along with practical female instructresses.

TEACHING METHODS ARE IMPORTANT.

In Great Britain teachers of technical subjects at present have had little or no training in educational methods. An effort has been made to remedy this in Hawick by providing a certain link between practical technical requirements and mat weaving in the Kindergarten. By teaching the building up of fabrics first, the student is all the better able to repair the imperfections.

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By conference with the teachers in the Kindergarten departments it has been brought about that the young children, in weaving with strips of coloured paper, soon learn to weave according to patterns which can be carried out on a textile loom.

In the other departments also even teachers recognized by the Government to teach Textiles do not proceed in an appointed method. This point is worthy of attention in connection with any new scheme of instruction. In fact it would be advisable to ask prospective Textile teachers to take the ordinary courses of educational method provided by the ordinary Teachers' Training Colleges.

Great stimulus is given to the work by the students preparing themselves for the London City and Guilds examinations in textile subjects, in connection with which certificates and prizes are given.

KINDS OF CLASSES.

The Hawick Technical Institute provides specialized courses in weaving and hosiery manufacture and in cloth mending with ten classes. The names of these classes will suffice here to indicate the character of the work which is undertaken: The classes are arranged as *Wool and Worsted Weaving and Designing* for each of four years; *Frame-work Knitting and Hosiery Manufacture* for each of three years; *Cutting out and Finishing Hosiery Garments* for each of two years; *Cloth Mending*, one year.

SECTION 2: GALASHIELS.

Galashiels is another headquarters for Scotch tweeds. Here also the appearance of the workers and their homes equal the best that were seen in Germany. Both towns had every appearance of being well kept, with no evidence to an observant visitor of anything like slum life or slum quarters. Many workers own their houses. In the factories which were visited the workers seemed to be intelligent, capable and interested. On every hand one had evidence of good organization and absence of hurry-scurry. If loafing or idleness took their toll they were not obtrusive. Particularly at one mill at Selkirk, the buildings themselves and their surroundings had an appearance of solidity and beauty which in Canada one would expect only in an educational or art building. One of the proprietors said he was sure the buildings and their surroundings and appointments gave "tone" to the workmen and the work which was advantageous alike to the employer and those employed.

In addition to the usual Board Schools, with their Supplementary and Continuation Classes, Galashiels is the seat of the South of Scotland Technical College.

THE GALASHIELS TECHNICAL COLLEGE.

So far back as 1883 classes for instruction in the technique of woollen manufacturing were commenced in Galashiels, under the auspices of the Manufacturers' Corporation. In course of time the management of the classes

passed into the hands of the Burgh School Board, associated with the Deacon and Deacon elect of the Manufacturers' Corporation, while the Corporation made an annual contribution towards the expenses of the school. In recent years the success of the school has been phenomenal. The students have gained the highest distinctions in the examinations of the City and Guilds of London Institute, while their interest and enthusiasm in the ordinary work of the school have been great. The school had won such a high reputation that when the manufacturers and others were invited to contribute towards the new Technical College scheme, a sum of £10,120 was readily forthcoming, which, supplemented by a grant of £10,000 from the Scotch Education Department, has enabled the managers to bring the scheme to a successful issue.

The College buildings consist of a main two storey portion in the Classical Renaissance style of architecture, 161 feet long by 54 feet broad. Provision is made on the ground floor for two lecture rooms and laboratories for pattern analysis, textile testing, fibre analysis, dyeing, colour, mechanics, physics, machine drawing, with textile museum, principal's and teachers' rooms. The upper floor affords space for art, chemistry, electricity and building departments, with Board room and lecture hall. Behind the main building extends a shed of 9,000 square feet in which is placed the textile machinery of the school. The equipment consists of 60 handlooms for students' use in experimental weaving and designing; 6 power looms, warping, warp and weft winding; a set of woollen cards with the different feeds and condensers; mule; twisting frame; knitting machines, besides smaller apparatus.

The Institution was primarily intended to serve the purpose of a Woollen School for Scotland. It is devoted chiefly to instruction in the principles and practice of fancy woollen and worsted cloth manufacture; and it has evening work in other subjects such as engineering and building construction.

Surrounded as the College is by woollen manufacturing concerns of the highest reputation, it is kept in living contact with every throb of all that is best in the industry. Exceptional facilities are thus afforded of learning the business and its technique under thoroughly practical conditions.

No effort is made to train operatives to become more dexterous. That is not required, because ample facilities are afforded in the mills. The influence of the College and the classes is directed towards the development of good character. Students are made to feel that they are part of an honourable institution with a reputation which must not be lowered by any unworthy conduct on their part.

The governing body consists of five members of the School Board at Galashiels, three manufacturers and one sculptor.

The income in 1910-11 was derived from Government grant, £1061; fees, £122; local rate, £410. There are five departments: (1) A Woollen Manufacturing Course with an attendance of 12 full day pupils, 10 part time day pupils and 130 evening pupils; with 40 pupils in Cloth Mending. Of the 150 ordinary evening pupils about 100 aim to be designers or hold some position which requires a knowledge of designing. (2) A Dye and Chemistry Department with 25, mostly evening students; (3) Engineering 50 students, all in evening

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classes. The day occupations of these students are as draftsmen, fitters, turners, pattern makers, blacksmiths, moulders, and they are chiefly apprentices at those trades; (4) Building Construction Department with 40 to 45 students mostly joiners with some plumbers and building clerks; (5) A School of Art with 50 to 60 pupils. The total attendance is about 350 individuals.

The Director had 12 years' experience in woollen mills and was then selected as Evening Technical Lecturer. He had previously been an evening school student in Science, Art and Technology. In spare time during the day, while conducting evening teaching, he studied first for London University B.Sc., then Edinburgh B.Sc. Engineering, and D.Sc. Physics.

The staff have been selected by the Director from among a number of students by personal observation of qualities. The men have proved satisfactory. The teachers are all craftsmen, and their theoretical qualities are attested by City and Guilds of London Institute certificates in their several subjects.

The Head Art Master is an A.R.C.A. London. The other members hold, as a rule, first class honors (City and Guilds). The Engineering lecturer is a Whitworth Exhibitioner and Medallist in University and City and Guilds, South Kensington, etc., subjects.

The teachers are obtained from the most intelligent workers in the factories who have been students in the Evening Classes. These act first as demonstrators and then as assistants. When they become assistants they receive 5s. 6d. per hour.

The Principal receives more private applications for ex-students as designers, etc., than he can properly meet, and has frequently to recommend men who have not been students. Ex-students have been sent this year to Russia, France, Ireland, Yorkshire and various parts of Scotland.

CONVERSATION WITH DR. THOMAS OLIVER.

Information as follows was gathered in "Conversation" with Dr. Thomas Oliver, the Principal.

In the old days of the industry, when manual dexterity was the prime factor, the needs of the trade were met by the apprenticeship system, fostered by the Trade Guilds. This system of trade instruction aimed at making every unit in the industrial army equally efficient at the same work. Since practically every man in the trade was a weaver, nothing was to be gained by making one weaver better than another. The modern revolutions in the industry, brought about by mechanical invention, have also imposed a division of labor which fifty years ago would not have been entertained. The efforts of every worker are so restricted to part of the process of manufacture that he has no opportunity of becoming acquainted with the remainder of the process. Thus the value of the average individual decreases. The more a machine approaches to the automaton the less important the machine attendant becomes, and the more efficient must the 'overlooker' be.

Last year Dr. Oliver tried, in accordance with Departmental instructions, to make a course of Elementary Physics, Mechanics and Mathematics interesting to first year weaving students. On the third night he had a deputation waiting on him to try and get something more useful and agreeable substituted. "What's the use of these things to me? I am going to be a pattern weaver"—was the sum of the young person's wisdom.

GERMAN PROGRESS IN WOOLLENS.

The Germans try to develop the innate artistic and scientific faculties in their young men. Wherever work requires brains, and brains are invested in the work, the product of these brains will appear in the long run. "At the present time" said Dr. Oliver, "our continental rivals are far behind in the matter of style in the production of fancy woollens. Fifty years ago they were far behind us in industries from which they have now completely ousted us. Now, I am confident that when the Germans put as much brain power into the manufacture of fancy woollens as they have put into the dyeing industry, into the electrical industry, and into the application of optics, they will succeed equally as well. It will lie with us to see that we are not pushed out of the market by superior products."

EDUCATION MADE APPLICABLE.

"A new spirit is suffusing minds in the woollen industry. The most conspicuous evidence of the fact is shown in the erection of this College. Ten years ago we would have deemed such an expenditure a ridiculous waste of money. But education is less costly than ignorance. An outlay which promotes the intelligence and the industrial efficiency of the community is well spent. Many and varied are the causes assigned for industrial depression. Good times make employers and employed wasteful and careless. The Peruvian silver mines were the cause of the downfall of Spain. The excessive pursuit of the various forms of sport, the enormous drink traffic, lower wages and longer hours of foreign workers, the edicts of Trades Unions, the tariff walls of other nations, are all advanced as causes, and are undoubtedly prime factors in the decline of many of our industries. But one which is too often ignored is that we are deficient in the knowledge of our business. We have been playing at technical education for thirty years.

"Technical education is not magic nor jugglery; it is merely common sense organized. I am not one of those people who assert that education is the prescription that will cure all ills. The technical education of thirty years ago, although meeting a great need at the time, has been in measure found wanting. It took insufficient account of the diversity of modern industry. Moreover, there has been no effective system in operation which ensures that the right kind of student will receive instruction. The instruction has been too pedantic, too much dominated by the atmosphere of the University. This is more evident

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in engineering than in textiles. Every Technical College prospectus in the country has had engineering on the same model, viz., the University course. The young student struggled through his University career, secured a post as a technical teacher, and promptly commenced to inflict a miniature University Course on his students, forgetful of the fact that none of his students were going to be teachers. They hope to be foremen of turning, fitting, pattern making shops and so on."

IRELAND.

CHAPTER XVIII: OUTLINE OF THE EDUCATIONAL SYSTEM.

INTRODUCTORY.

Ireland has a total area of 32,605 square miles, 945 of which are water and 1,800 bog land. In round figures it contains 20,000,000 acres of land, about three quarters of which is classed as cultivable. Ireland is bounded on the North, West and South by the Atlantic Ocean and on the East by the St. George's Channel and the Irish Sea. The distance from the coast of Wales is about 50 miles and from that of Scotland thirteen and a half miles.

The climate is somewhat warmer than that of England, the mean annual temperature being about 50 deg. F. The atmosphere is more humid than that of England or Scotland and this, with the frequency and uncertainty of rainfall in the summer, has a retarding influence on the ripening and saving of the grain crops.

The population for 1911 was estimated at 4, 381,951, showing a decrease of 1·7 % within the previous ten years. The decreases in the decennial periods are becoming smaller. The decrease in population from 1881 to 1891 was 9% and from 1891 to 1901 was 5·2%. The emigration to the United States is largest. In 1911 the numbers who went to the United States were 36,616; to Canada, 6,807; to Australasia, 3,554; to British South Africa, 996; to other places, 1,318. Between 1851 and 1910 over 4,187,000 persons emigrated.

OCCUPATIONS OF THE PEOPLE.

According to the census of 1901 the occupations employing the largest number of persons were as follows:—

General or local government.....	34,281
Professional occupations.....	55,175
Agriculture.....	859,525
Fishing.....	10,434
In and about mines, quarries, etc.....	6,512
Workers and dealers in clothing.....	141,588
Textile fabrics.....	110,208
Building and works of construction.....	60,977
Metals, machines, etc.....	41,179
Paper, printing, books and stationery.....	11,563
Wood, furniture, fitting, etc.....	11,040
Skins, leather, etc.....	4,267
Precious metals, jewels, etc.....	3,148
Chemicals, oils, soap, etc.....	2,896
Gas, water and sanitary services.....	1,715

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Brick, cement, pottery.....	1,381
Domestic offices or services, excluding domestic outdoor service.	202,238
Providing food, lodging, etc.....	75,148
Transportation.....	71,255
Commercial occupations.....	39,323
Other general and undefined workers.....	177,516

Total number occupied..... 1,949,607

SECTION 1: THE NATIONAL SCHOOLS.*

The object of the Irish National Schools is to afford to children of parents of all religious persuasions, under safeguards and regulations which secure the fundamental principle of non-interference with different faiths, (1) literary and moral instruction given in common to all scholars; and (2) separate religious instruction to those of different faiths without interference with secular education. No child can be excluded, either directly or indirectly, from attending any National School by reason of religion or social position, and no school for any select class of children is recognized as a National School.

The main basis on which the development of Primary Education in Ireland is organized is the granting of aid by the Commissioners of National Education (subject to general principles as above) to local patrons and local managers of National Schools. This aid takes the form of grants and loans for building and repairing school houses and teachers' residences; grants of salary for teaching staffs; and free grants (or supplies at reduced rates) of books, maps and requisites for the use of schools, teachers and pupils.

TWO CLASSES OF SCHOOLS.

Ordinary National Schools consist of two great classes:—(1) "Vested" schools are such as have been built by the aid of grants from the National Board (two-thirds of the estimated cost of building, furnishing and enclosing the school-house, the remaining third being provided locally) and secured for educational purposes by leases to the Commissioners themselves or to Trustees, in the latter case the Commissioners also being parties to the leases; (2) "Non-vested" schools are such as have not been built by aid from the National Board or secured to them by lease. Convent or Monastery Schools may be either Vested or Non-vested.

SYSTEM OF MANAGEMENT.

Both the above classes of schools are directly under the patronage of some person or persons. If the school is vested in the Commissioners, the name of the patron (who is generally the grantor of the site of the school) is inserted in the lease, and if the school is vested in Trustees the latter are recognized as the patron. If the school is non-vested the patron is usually the person who applies

* The material for this summary was obtained from the memorandum by The Right Hon. C. T. Redington, D.L., Commissioner of National Education in Ireland, in "Special Reports on Educational Subjects" issued by the Education Department, London, Eng., 1896-7,

to the Board for aid in the first instance; but if a local committee is managing the school then the committee is the patron. The patrons have the right of managing the schools themselves or of nominating as local managers fit persons, such as clergymen or other persons of good position living in the vicinity; and these are charged with the direct government of the schools, and must undertake to visit them frequently and see that the regulations of the National Board are complied with. The Commissioners reserve the right to refuse to recognize any patron or manager, or to withdraw their recognition of such after investigation. The local managers, subject to the approval of the Commissioners, appoint the principal teachers, assistant teachers, work-mistresses, etc., but the Commissioners appoint the "monitors" from among the best pupils of the National Schools, on the recommendation of the District Inspectors. The local managers have the right to dispense with the services of any member of the teaching staff, and the Commissioners also reserve the right of refusing to recognize or to continue the recognition of any member of the teaching staff, and of fining, dismissing, reprimanding or otherwise punishing any teacher or monitor when necessary.

Great interest is taken in the conduct of the schools by the local managers, of whom there are about 3,000, including clergymen and laymen of Christian denominations as well as some Jews.

CURRICULUM.

The Commissioners have made the following subjects compulsory in all schools:—reading, writing, arithmetic, spelling, grammar, geography, together with agriculture in rural schools for boys and needlework in all girls' schools. The following extra subjects are taught in addition to drawing and music:—Classics, French, Irish, German, instrumental music, physical science, chemistry, hygiene, geometry, agriculture, dressmaking and other industrial branches.

Many National Schools have private endowments, and schools of this class have been included in endowment schemes formulated under the Educational Endowments (Ireland) Act of 1885; and the Commissioners in some instances have representatives on their Governing Boards. Under the operation of the Irish Education Act of 1892 most of the National Schools have become free, and when the compulsory attendance clauses of that Act fully operate it is expected that the attendance will be largely increased.

TEACHERS AND GRANTS.

Many National Schools are recognized in connection with convents and monasteries, and in some of them the teachers, though members of religious communities, are "classed," and the schools conducted and the teachers paid precisely in the same way as the ordinary National Schools. In the case of such schools where the teachers are not classed, and consequently not paid the class salaries, the conductors of such schools receive a "merit capitation grant" of 10s. or 12s. per annum per pupil on the average daily attendance, according

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to the proficiency of the pupils generally as reported by the Inspector. These unclassed convent and monastery schools are dealt with as ordinary National Schools, the essential difference between them and the latter being that the teachers of ordinary National Schools are lay persons. The Commissioners recognize lay persons as industrial teachers in Convent Schools, and pay them fixed salaries, but do not pay "lay" persons who assist in ordinary instruction in Convents though such must be "classed" teachers.

The training of National teachers is provided for in five training colleges. Three of these are Roman Catholic (two for males and one for females), one is Protestant (for both sexes) and one, entirely controlled by the Commissioners (the Marlborough Street College) is undenominational for both sexes. At these colleges nearly 800 students attend annually.

TRAINING COLLEGES.

Each college has two courses: (1) for National teachers already "classed" who have actual charge of schools but who employ substitutes during their absence for one session at college; (2) for "classed" teachers who have not charge of schools; also for pupil teachers, monitors and other suitable candidates. This course covers two sessions. These students are granted diplomas of training after completing their courses and two years' satisfactory service in National Schools. The college authorities are paid £50 per annum for each male teacher trained and £35 for each female teacher trained, besides diploma bonuses of £10 and £7 respectively.

Professors and staffs of the Denominational Colleges are appointed by their managers subject to the general approval of the National Board.

Practising National Schools are attached to each college and the teachers in these schools have special privileges as regards salaries.

Since 1879, teachers may receive pensions after retirement at the age of 55 for males and 50 for females, three-fourths of the benefits being provided from the Government endowment, the remaining fourth being contributed by the teachers.

Teachers under the Irish National system must be qualified as being persons whose attainments have been tested by examination, or as members of religious communities of men and women devoted to teaching. Where "class" or special salaries are claimed the school attendance must be sufficiently numerous to warrant such payment, an average daily attendance of 20 pupils being required. Special arrangements are made in cases of small schools on islands.

Teachers of ordinary National Schools receive in addition to salaries, "results fees" according to the answering of their pupils at the annual "results examination"; capitation payments from the local taxation (excise and customs) grant of £78,000 per annum; payments out of the grant for free education under the Irish Education Act of 1892; gratuities for training monitors; and premiums from certain local contribution funds. Workmistresses are not classed as teachers; they are paid an annual salary of £12 and get a share of the results fees. Industrial teachers are usually paid a salary of £24 per annum, and do not receive results fees.

INSPECTION.

The country is divided into 66 districts, each having an inspector in charge. The 6 head inspectors exercise general supervision over the district inspectors and their assistants and also have actual inspection of a number of schools.

Each National School is examined yearly for results, and the inspector's report covers the marks obtained in each subject by each pupil examined, the class in which the child was previously examined, how long enrolled in the class in which he was last examined, etc. The inspector also carefully examines the school accounts and verifies the number of attendances of each child. No results payments can be sanctioned for any child who has made less than 100 attendances in the results year.

In Ireland the schools meet only once each day for four hours' secular instruction, and a child must be present before the rolls are called to warrant his attendance counting for "results" purposes. In National Schools situated in Poor Law Unions, which are "contributory" under the Act of 1875, the Guardians pay the teachers 50% additional to the results fees earned, but in such cases the Guardians and not the teachers receive the share of the customs and excise grant aforesaid.

MODEL SCHOOL DEPARTMENTS.

Besides the ordinary National Schools there are Model School Departments in towns and townships, these schools being owned, controlled and directly managed by the Commissioners. The teachers are usually selected by competitive examination, the Headmasters being provided in most cases with residences or cash allowances in lieu of them, and additional special payments are available for such masters and mistresses under certain contingencies. Monitors are employed in Model Schools under the same conditions and at the same rates of pay as in ordinary National Schools. In addition to monitors, Pupil-teachers (who must be at least 16 and not over 20 years of age) are appointed for only one year on the recommendation of the head and district inspectors after examination, but may be continued for a second year; they are not recognized in any except Model Schools. At the end of their first year of service, they may, after passing a satisfactory examination, be placed in the lowest grade of "classed" teachers, and after a second year's service may be promoted to the first division of that class on the same conditions. These pupil teachers get free grants of books on first appointment, are paid £26 per annum, with gratuities, and if retained a second year receive a small quarterly salary.

EVENING SCHOOLS.

Evening schools are recognized in connection with Model, Convent, Monastery and ordinary National Schools. Teachers of evening schools in connection with Model Schools are paid special rates of salary; in connection with Convents and Monasteries £10 per annum is allowed for every 100 pupils

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in average attendance; teachers of other evening schools receive £1 per month while the school is open. Teachers of all evening schools are entitled also to results fees, but receive no benefit under the Act of 1892. Evening schools must be open three evenings weekly for two hours each evening, and will not be examined for results unless in operation for six continuous months.

SECTION 2: DAY SECONDARY SCHOOLS.

In "Conversations" with Mr. T. P. Gill and Mr. George Fletcher the Commission gathered information concerning Day Secondary Schools which are under the Intermediate Board of Commissioners. The following are some of the main points so gathered; others are dealt with in Chapter XX—"Conversation with Mr. George Fletcher."

As to the Day Secondary Schools being dealt with directly by the Department, Mr. Gill said it might be interesting from the point of view of some Canadian circumstances to state that all the Secondary Schools in Ireland, without exception, are voluntary schools, and none of them were created by the State or the Local Authority. Nearly all have been in existence for many, many years, some with foundations, some with none, but all without exception receiving State grants either from the Intermediate Board or from the Department.

The principle adopted in administering the grants from the Department of Agriculture and Technical Instruction leaves it free to disregard everything concerning these schools except the efficiency of the teaching of the particular programme for which the Department paid the grants. For example, the Department would go into a school like St. Andrew's College, which is Presbyterian, or Mount Joy Church of Ireland School, or a school maintained by the Free Mason body, or the Catholic Schools conducted by the Christian Brothers, or the Convents. It was a matter of no concern to the Department what religion, if any, those schools taught provided they taught the Department's programme (Experimental Science, Drawing, Manual Instruction, Domestic Economy) in an adequate manner, gave a proper amount of time to it, employed in the teaching of it teachers adequately qualified, and also permitted the most complete inspection by the Department. If those conditions were fulfilled, and the Department's inspection at the end of the year revealed that the schools had given adequate time to the programme and taught it well, then the grant would be paid.

There are no Secondary Schools that receive Municipal assistance; they are all private schools. The Department grant does not form a very substantial part of their expenses, but they also get grants from the Intermediate Board, which administers grants for Secondary Education in the schools. The programme of that Board has been co-ordinated with that of the Department; so that they fit in.

GRANTS FOR SECONDARY EDUCATION.

The total grant from the Department and the Intermediate Board together would be about £4: 10s. per pupil, hence it would be impossible to furnish any—
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thing like the excellent system of Secondary Education in Ireland but for the fact that a very large number of these schools are provided by religious orders and have voluntary teaching, the salaries not cutting much figure. The cost of a Secondary Day School pupil in Ireland generally might be put at from £14 to £18, and the Government grants did not amount to nearly half that. If the Department of Agriculture and Technical Instruction went on the plan of saying that it wanted a particular type of school that would fulfil this or that condition, and that it would not give grants to any other schools, it would start out handicapped with a very costly programme. On the other hand if the Department said it wanted a certain programme taught and certain results accomplished by the schools, and that if it received them it would pay for them, that plan would secure what were considered most valuable conditions—minimum cost and maximum results.

SECTION 3: AGRICULTURE, INDUSTRIES AND TECHNICAL INSTRUCTION.

The watchwords of the movement for progress in Ireland, through the improvement and extension of Agricultural, Industrial and Housekeeping Education, are imperishably connected with the name of Sir Horace Plunkett: "Better Farming; Better Business; Better Living."

The recent developments had their immediate origin in the Report of what is known as the Recess Committee. That Committee was formed on the invitation which Mr. (now Sir) Horace Plunkett issued in August 1895 to a number of Members of Parliament and other Irishmen of various political opinions, to meet for the discussion of any measures for the good of Ireland about which all parties might be found in agreement.

RECESS COMMITTEE'S WORK.

The Recess Committee evidently did its work in a thorough-going manner. Its Report, which was issued in August 1896, recites what the Committee undertook to do.

(1) It first devoted its attention to the existing economic condition of Ireland, and sought to trace its industrial shortcomings and commercial disabilities to their more direct causes.

(2) It next reviewed the immediately available resources of the country, and considered the possibilities of their development.

(3) It then caused enquiries to be made in those European countries whose experience in the improvement of their agricultural and industrial condition might guide those interested in the material progress of Ireland. For that purpose it sent special Commissioners to the following countries:—France, Belgium, Holland, Denmark, Bavaria, Württemberg, Austria, Hungary and Switzerland.

(4) The Committee endeavoured to utilize foreign experience in making suggestions for the promotion of agriculture and industries in Ireland.

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Referring to the various countries in which enquiries and investigation had been made, the Report states:—

Various though the circumstances of these different countries are, it is a striking fact that we find the same main principles adopted by them all in promoting agriculture. The three great principles, which are common to all, may be summed up in three words: Organization, Representation, Education. That is to say: organization of the agricultural classes themselves in societies, clubs, or corporate bodies for the advancement of the various branches of their industry; representation of the opinion of the farming classes in the administration of State aid by Government Departments; and education of the farming classes, both adults and children, in all technical knowledge appertaining to their industry.

The Committee also reported that they found decentralization, the free play of local individuality, and direct relationship with local industries to be the keynotes of artistic and technical training throughout the Continent.

The general conclusion arrived at by the Committee was:—

(1) That the administration of State aid to industries in Ireland, on the principles to be described, can be most effectively carried out by including the two branches of Agriculture and Industries, and the Technical Instruction relating thereto, under the care of one Department of the Government specially created for the purpose;

(2) That this Department should consist of a Board with a Minister of Agriculture and Industries responsible to Parliament at its head, and a Consultative Council representative of the agricultural and industrial interests of the country.

As the result of these enquiries and investigations, the Chairman of the Committee, in a letter to then Chief Secretary to the Lord Lieutenant of Ireland (The Rt. Hon. Gerald W. Balfour, M.P), said, "While we do not anticipate an immediate fulfilment of all the possibilities we indicate, we are confident that rapid progress on the lines suggested is within the bounds of practical attainment."

LESSONS FOR CANADA.

The conditions which existed in Ireland in 1896 were in many respects so much like those in Canada in respect to training for Agriculture and Industries, that an extended and reasonably full statement is given of the organization and work of the Department of Agriculture and Technical Instruction which was created as the result of the report of the Recess Committee. A further reason lies in the fact that the current and intimate knowledge, gained by practical experience, enables the Department to judge how far the system which was inaugurated and the methods which have been followed are appropriate and efficacious.

Our Report is limited to the main features of the work which is directly educational.

The Department issued its first Annual Report in 1899-1900. After 10 years of experience, some modifications in the methods of administration have been made, extensions have been added, but on the whole, the organization, system and methods then adopted have proven themselves well adapted to meet the situation. On all sides one finds testimony, through his eyes and ears,

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to the happy results, of a regeneration of agriculture and of a revived interest in and preparation for industries, which are being accomplished by the joint work of the Department, Local Bodies and individuals.

The members of the Recess Committee rendered such an illustrious and lasting service to the cause of agricultural and industrial education in English-speaking countries, that the Commission takes the liberty of recording their names in this Report, and of paying its tribute to their work: they served their own nation well, and have enabled Ireland to contribute to the progress of civilization with increasing advantage to itself and marked benefit to other countries.

MEMBERS OF THE RECESS COMMITTEE.

Chairman—Hon. Horace Plunkett, M.P.

The Earl of Mayo.	William Field, M.P.
The Lord Montague, K.P.	Hon. Mr. Justice Ross.
Rt. Hon. The Lord Mayor of Dublin.	Right Rev. Monsignor Molloy, D.D.
Rt. Hon. The O'Connor Don, H.M.L.	Thomas Andrews.
Rt. Hon. Joseph M. Meade, LL.D.	Valentine B. Dillon.
Rt. Hon. Thomas Sinclair, D.L.	C. Litton Falkiner.
Sir John Arnott, Bart., D.L.	Rev. T. A. Finlay, S.J., F.R.U.I.
Sir Thomas Lea, Bart., M.P.	Thomas P. Gill.
John Redmond, M.P.	Joseph E. Kenny, M.D.
John H. Parnell, M.P.	H. Brougham Leech, LL.D.
Richard M. Dane, Q.C., M.P.	Count Moore, D.L.

ULSTER CONSULTATIVE COMMITTEE.

Chairman—James Musgrave, D.L.

Thomas Andrews.	Rev. R. R. Kane, D.D.
James Dempsey.	Robert MacGeagh, J.P.
Sir Daniel Dixon, Knt., D.L.	R. J. McConnell, J.P.
Sir W. Q. Ewart, Bart., D.L.	Alex. Robb.
John Fagan.	Thomas Roe, J.P.
Maurice Fitzgerald (Professor Queen's College, Belfast).	Rt. Hon. Thomas Sinclair, D.L.
	John F. Small.

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CHAPTER XIX: CONVERSATION WITH MR. T. P. GILL.

Information obtained from "Conversation" with MR. T. P. GILL, Secretary of the Department of Agriculture and Technical Instruction for Ireland.

The object and scope of this department may be quoted from the opening paragraph of the pamphlet, "Organization and Policy of the Department," as follows:—

The purpose of the Agriculture and Technical Instruction Act, 1899, is to establish an Irish Department of State, so constituted as to be representative at once of the Crown, the recently created local government bodies of the country, and those classes of the people with whom its work is chiefly concerned; and to give to this Authority the function of aiding, improving, and developing the agriculture, fisheries, and other industries of Ireland, in so far as may be proper to such a Department, and in such manner as to stimulate and strengthen the self-reliance of the people.

The Department represents a number of branches heretofore existing that had in various ways relations with agriculture or administration of some department, and included the Veterinary Department, also the functions of the Registrar-General and the Land Commission related to agricultural statistics; also the administration of sundry other Acts. It included also the functions of the Board of Education, South Kensington, (London), in relation to the administration of the Science and Art grant, the grant in aid of technical instruction, and the Science and Art institutions in Ireland; also those of the Board of National Education in connection with the Albert Institution and Munster Institution. It is important to realize that these were scattered elements of administration, staffs and endowments that were in existence and that were brought together under common direction and with a common co-ordinate idea, which is thus stated:

The organization of the Department has been carried out, so far as it has gone, in careful observance of the fact that there is an essential unity of purpose behind its various functions, whether these directly concern the development of agriculture and industries, the promotion of technical instruction, the collection and publication of information, or the administration of laws to prevent the spread of contagious diseases amongst cattle and other live stock, and fraud in the sale of agricultural requirements and produce.

FUNDS AVAILABLE AND HOW APPLIED.

The various funds at present available were made up of votes of Parliament in connection with the branches of administration taken over when the Department was constituted, and in addition a special endowment fund, to be administered by the Department for its new work. There was first the grant due to the country under the heading of Local Taxation, Customs and Excise, amounting to £78,000; another, called the Irish Church Temporalities Fund, consisting of a surplus remaining after the disestablishment of the Irish Church, amounting

to £70,000; a third fund, amounting to £12,000, came from economies made in legal administration when certain judgeships were abolished, and the salaries attached thereto were offered to the Department. Then there was the money annually spent on the institutions at Glasnevin and Munster, £6,000; these funds making together £166,000 per annum, which is an annual grant. Since then the Department gets, under the Congested District Boards Act, a special fund of £19,000 additional. These moneys are called the Department's Endowment Fund, and every three years it is divided into two sections—£55,000 going for Technical Education, as distinct from Agricultural Instruction, and £10,000 being set aside for Sea Fisheries. A few other small items need not be mentioned. The remainder is given to all the purposes of agriculture, including improvement of live stock and schemes for agricultural education and development generally. The £55,000 for Technical Education is every three years divided into sections again, one going to the large cities and county boroughs, and the remainder to the small towns and the balance of the country.

The Department receives from the Imperial Exchequer two other sums,—one of £5,000 under the Act of 1902 and the other of £7,000 from the Development Fund.

The Department has two Boards, one for Agriculture generally, and the other for Technical Education; the former administers everything that the other does not, and also deals with Fisheries. The Agricultural Board has voted an additional sum of £9,000 from its funds to be applied by the Board to technical instruction in rural districts.

The item for training teachers in Nature Study in rural schools comes from the sum the Department keeps for central purposes, to be used for the whole country and not for a given district. Teachers come from different parts and go to different parts of the country, and their training is considered one of those central purposes and paid for in that way. For Summer Courses for other teachers, whether for town or rural districts, to teach Science in Secondary Schools, a part of the Parliamentary grant is obtained through the Treasury. There are thus, it is to be noted, different sources from which funds are got.

SCIENCE AND ART REGULATIONS.

One additional main item is the administration of the old Science and Art grant from South Kensington that was applicable to Ireland the same as to the rest of the United Kingdom when this Department came into existence, but which had been very poorly utilized in Ireland. One reason for this was that the regulations were not suitable to Irish conditions; another, the competition of the Intermediate system. When the Department started, the full amount utilized for the teaching of Science and Art was £4,000. In consultation with the teachers, and using the knowledge that some of the leaders possessed of the circumstances of the country, the Department got the Treasury to agree to a new set of regulations more suited to the conditions of Ireland, and the result is that for the teaching of science and art in the secondary schools the sum earned has increased in 10 years from £4,000 to about £28,000. This is provided from the Treasury at London, and is separate from the Endowment Fund.

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The South Kensington fund is allocated according to regulations which lay down conditions under which it is to be earned. This Department has to approve of the programme adopted by the school, to inspect the teaching of that programme, and to satisfy themselves that the teachers possess the qualifications laid down by the Department, then certify that the school has earned the grant which comes through the hands of the Department. The Treasury will not pay the money to the school except on the authority of the Department.

The Royal College of Science, the Metropolitan School of Art, the National Library of Ireland and the National Museum and Royal Botanic Gardens at Glasnevin were formerly administered from South Kensington, but have come over to the Department, and with them the grant that maintained them. At that time the grant was about £32,000 in all but it has been increased since. The Department appointed a Committee to study and report as to the future of the College of Science, and on its recommendations the College was reorganized and a new building has been provided by the Imperial Treasury involving additional money.

Another set of regulations were made available for the Evening Technical Schools, and they were so suitable that nearly every one of those schools is now able to avail itself of these grants, which have grown from a very small figure up to £27,000. In round figures the whole scheme now comes to £55,000 from the Imperial Treasury, apart from the Department's Funds.

SCHOOL GARDEN WORK.

Great pressure has been put on the Department from various people in the country to have the Horticultural instructors, who are teaching the cottagers how to improve their holdings, put into the work of teaching garden work to elementary school children. This the Department could not do, but they had undertaken to train the National teachers for the purpose by short courses.

The Endowment Fund—that is, the Department's Funds—is administered with the assistance of the two Boards mentioned, but the Department itself has organized its work on a plan intended to give effect to the principle already quoted—that of essential unity amongst all its functions. The aim has been to have a series of branches, each manned by a qualified staff, and in a position to concentrate its entire energy and expert skill upon its special task as if it were a distinct department in itself, while at the same time its work is brought into harmony with the general purpose of the Act and gains from having behind it the resources of the entire Department.

BRANCHES OF THE DEPARTMENT.

The machinery for the general direction and co-ordination of the branches is provided by the officers, Vice-President and Permanent Secretary. The branches are:—

(1) Agriculture—dealing with the whole field of agricultural administration, including Agricultural Education;

(2) Technical Instruction, administering the specific endowment for Technical Instruction, the Science and Art branch of the Secondary Schools, and evening technical schools:

(3) Fisheries Branch, dealing with the Fisheries;

(4) Statistics and Intelligence Branch, dealing with a very elaborate system of statistical information, and acting also as the Intelligence Department. Through this branch the Department is in communication with practically every Government Department in the world like their own, with every department of Technical Instruction and of Agriculture. It receives not only their publications, but those of the press of various countries relating to their work and has a system by which a synopsis of anything that may be new in information, that comes in from the whole world, is circulated amongst the branches every month, and sometimes every week, so that every branch is kept in touch with what is going on all over the world in connection with its work;

(5) Veterinary Branch, which deals with administration in connection with diseases of animals;

(6) The Grants Branch, which is the Treasury Department.

BROAD PRINCIPLES OF ADMINISTRATION.

The first of the broad principles on which the Act is administered is to secure an effective *modus operandi* by which both local initiative and central contribution will have every opportunity. All the agricultural and technical instruction work of a local nature is administered through Committees of the Local Authority which are called into existence by the Act. In the Counties they are Committees of the County Council; in the towns Committees of the Municipal Council, expressly formed under the Act for that purpose. The County Committees administer all the live stock schemes and local agricultural instruction, and the city Committees administer all the technical instruction schemes. The local authorities raise rates for the promotion of this work, and unless they do so, they are not entitled to receive any grants from the Department. When they raise a rate and submit a scheme that the Department approves, a grant is made for it, and the local authorities administer the scheme subject to the inspection of the Department, which practically fixes the standard. The Department lays down qualifications of various types of teachers, and will not approve of any being employed who have not these qualifications. This is one of the most important principles to be noted in the working of the Act. Great pressure is nearly always brought to bear on the Department to allow a teacher to be employed who has not quite obtained the qualifications required, but the Department has always refused, except in most *bona fide* exceptional circumstances.

This is the only safe principle in the end, because the teaching must be absolutely right.

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LOCAL RATES AND DEPARTMENT GRANTS.

The local authorities are asked to raise a certain amount of money before they get the Department's grant. Some districts are poorer than others, but the Department says that they must raise such a rate as in the circumstances of their locality they should raise. For example, a penny rate in the County of Mayo would not raise anything like what a farthing rate would in a district in part of the County of Down. It is that poor district that is most in need of grants; so that where a poor district does its duty, although the total amount raised may be a small one, the grant is given, and given at a higher rate to a poorer district than to a richer one. Pound for pound may be given in one case, and thirty shillings to the pound in the other. The proportions are modified in that way.

The idea is to stimulate local initiative and sense of local responsibility as much as possible, while conserving the equally necessary principle of central suggestion and supervision. There must be a body which is able to look at the question from the point of view of the whole country; a body which has experience of what is going on in the country itself as well as outside—which no local body can have. It is most important to conserve the effectiveness of action of that body. Various movements of opinion come into the plan to destroy that effectiveness, because the control of a central body is always irksome to a local body that does not quite agree. While all those difficulties were met in the beginning, the local authorities throughout the country have now come to realize that the Department has generally good reason for what it recommends and decides. The upshot is that local authorities invite the Department's interference and guidance again and again. That remark applies to schools looking for the advice of the Department's inspectors as well as to local authorities, who constantly ask that an inspector be present at the meeting when they are settling their schemes for the year.

DIRECT AND INDIRECT MEANS.

Another principle has been to distinguish between direct and indirect means of action in promoting agriculture and industries. The direct means include all that relates to the improvement of live stock on the agricultural side; to exploitation of Irish products in the market; and to assistance to industries on the technical instruction side. The main indirect means of action is education—the instrument that the Department regards as most potent of all.

One principle of the Department's educational policy is that although administering a specific branch of education, the Department does not look upon that apart from the education of the country as a whole, which must be considered as an organic unity.

The other fundamental principle is to consider the pupil with regard to the formation of the all-round man, and not merely to give to specific technical aptitudes. Experience has shown—and of nothing was Mr. Gill more firmly convinced than this from his own experience—that even for making a man

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efficient in a purely technical calling, the more that broad human preparation of the man was regarded, the better would the technical work be done. The effort must be to make a man of him, and not merely a machine. The following passage occurs in the very first statement of the Department's policy:—

The Department do not desire that Ireland, at this period of transition in her educational history, should fall into the mistake, which, it is beginning to be recognized, has been committed elsewhere, of underestimating the value of the human and ethical parts of education even in the direct production of utilitarian results.

CHAPTER XX: CONVERSATION WITH MR. GEORGE FLETCHER.

Information obtained from "Conversation" with MR. GEORGE FLETCHER, Assistant Secretary in respect of Technical Instruction, Department of Agriculture and Technical Instruction for Ireland.

This Branch of the Department is concerned with the following operations:— (1) Secondary Schools; (2) technical schemes in various urban centres and rural districts; (3) Central Institutions; (4) the policy in regard to industrial development.

When the Technical Instruction Act of 1899 was passed there was transferred to this Department the administration of the grant for Science and Art in Ireland, and also the administration of the grant-in-aid of technical instruction as defined by that Act. The South Kensington authorities had made grants to Secondary Schools in Ireland before this Department came into existence. The Department inherited that power and right, and has exercised it to the full, and while it worked under the South Kensington regulations for several years, it was found that those regulations, unsuitable for Scotland and England, were still more so for Ireland; hence no time was lost in altering them.

The Department, recognizing that all Technical Education must be based on sound Primary and Secondary Education, endeavoured as one of their first steps in Technical Education, to reform the teaching of Science in the Secondary Schools of Ireland. An extremely small amount of science teaching was being done in the Secondary Schools when the Department established its programme. There was a programme of natural philosophy which did not involve any practical work whatever. It was tested solely by examination, and the number of students in the whole of Ireland had fallen down to something like 600—a desperate condition of things when it is realized that there are very nearly 300 Secondary Schools.

SCIENCE TEACHING IN SECONDARY SCHOOLS.

The Department had a fairly clear course, because they had the power to make grants for the teaching of science in Secondary Schools; therefore they established a programme which has some very interesting fundamental principles. First of all the Department said to schools, "We can make grants to you for the teaching of experimental science, but we require that the teaching shall be very practical in character, and that practical work shall be done by the scholars themselves. Mere demonstrations are insufficient. Therefore we cannot recognize a school which has not a fairly equipped laboratory for the teaching of science. Next, we require that teachers shall be trained to carry

out this course, which shall be for four years. The first and second years, called the preliminary course, shall be quite fundamental in character, shall impress the elementary principles of physics, and must be taught practically. For the third and fourth years you may choose among the specialized subjects:—physics, chemistry, mechanics, botany, or domestic economy for girls, drawing, or physiology or hygiene.”

The main difficulty at the very outset was that there were not in the whole of Ireland six laboratories in the Secondary Schools, neither had they the teachers. But the body that made the conditions gave the aid to meet them. On representations made to the Treasury a full grant was made for equipment for Science Laboratories—£5,000 a year for 5 years, or a total of £25,000. The Department also sanctioned County Council Committees making grants for this purpose out of the funds which had accumulated during practically the whole of the first year, before the schemes had been able to mature; so that all told there was probably £50,000 given to assist in equipping the Secondary Schools. The local authorities certainly gave as much more, because they had to provide buildings.

HOW TEACHERS WERE TRAINED.

The difficulty of teachers then appeared. Teachers were admitted pretty freely to Summer Schools, and if they had not taken a suitable course in some University or higher institution they were given special recognition after passing five sessions of summer courses. The fifth course might be a repetition of one of the courses gone through, or a special course in laboratory arts devised for the purpose of giving them some manual dexterity in making and mounting apparatus. These summer courses took in a large number of teachers, who were given travelling allowances and £3.10s. for personal expenses for the month. The students who attend at the Royal College of Science and the Metropolitan School of Art get this grant out of a parliamentary vote: but for all institutions outside those, the money comes out of the Department's Endowment Funds. There have been 500 or 600 Secondary School teachers every year in the summer courses, and as a result a very fair amount of training has been secured.

The Department decided to use the regular teachers for the science work in Secondary Schools. For Experimental Science and Drawing, three hours weekly are required. No school may take one without the other. The first and second year's course is fixed for the schools by the syllabus, and they all adopt this, although the Department allows them to draw up their own if they choose. One reason they are content with the syllabus is that they themselves have a voice in its revision.

ADVISORY COMMITTEE A SAFETY VALVE.

There is an Advisory Committee of Head Masters, and when any great change in the regulations is proposed, the Department calls them together and discusses these things with them. Sometimes they propose alterations or reductions, but the Committee is exceedingly reasonable. Mr. Fletcher con-

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sidered a Committee like this a most excellent affair, because changes, proposed as the result of experience in working, would be received very badly, and would cause passive resistance if not actual opposition, unless such changes commended themselves to the Head Masters.

The Committee formed a safety valve, for they could state all their objections and make all their vigorous remarks around the table and hear the reply. As a matter of experience there was always agreement in the end. This Committee is called probably once or twice a year, but with the understanding that they can come together oftener if they desire a meeting.

GRANTS—HOW ALLOTTED.

A school that cannot carry out a course for more than three years is not recognized for payment of grants without a special condition. No student can be recognized for grant unless he is aged 12. The Department's idea of a Secondary School is that the student should finish by 16. The programme has Experimental Science and Drawing in all classes. But if under the circumstances students cannot be retained for the third year, the school must take Manual Training. The idea is that a school that cannot retain students for more than a two years' preliminary course is rather a lower type of Secondary School. The pupils are probably the children of parents of industrial occupations and are therefore held for manual instruction. The science course applies to both boys' and girls' schools. In the latter, if they cannot take a third year they must take Domestic Economy. This does not imply that manual instruction is only necessary for that type of school, but it means that they, at least, must take it.

The principle on which grants are made to those schools, when these conditions are satisfied, is that they must have a laboratory and a qualified teacher and then grants are made solely on the results of inspection, there being no examinations. There is a staff of 15 inspectors who are entitled to go into those schools at any time and test the students in any way they may think fit. They make casual inspections during the year, and at the end of the session hold something of a field day or full dress inspection.

Then grants are made on the basis of attendance. It might be called a Capitation-Attendance-Efficiency system. That is to say, the greater the number of pupils the greater the pay; the larger amount of time devoted to teaching the greater the pay; and the normal grant fixed in this way is capable of being raised by one-tenth or lowered by one or more tenths on the report of the inspector. If he reports that it is meritorious teaching and above the average, the normal grant would be automatically increased by a tenth. If he says it is bad, the grant is lowered by one tenth, but if it has to be lowered by two tenths the school is warned that the grant will be withdrawn altogether if matters do not improve. On the whole the plan works very well, and 283 schools have taken it up.

CO-OPERATION OF INTERMEDIATE BOARD.

Mr. Fletcher did not think they would have taken it up so generally if the Intermediate Board, which controls the Secondary Schools, had not worked in

with the Department. As soon as the programme was published, the Intermediate Board passed a resolution adopting the Department's programme in place of their own programme of Natural Philosophy, and recognizing the Department's inspection in lieu of their own examination, so that the two bodies worked together in the matter. The Department inspects for the National Board, and the latter adopt the inspectors' passes and failures as their own. Hence schools find it convenient and profitable to work on the Department scheme, and there is hardly a school in Ireland that is not using that scheme.

Grants which were originally about £1,000 a year have gone up to £28,000. A school might get from 30s. to £2 per head of pupils, depending upon its efficiency, the amount of time it devotes and the excellency of the teaching. Mr. Fletcher said there was no branch of the Department's work less known than this, yet, in his opinion, none more worthy of attention, because he believed that Ireland stood out almost unique, certainly among the countries of Europe, for this class of work. He knew it was not done so well in England or on the Continent, and he ventured to suggest that this would be found a most interesting and profitable line of enquiry.

PRACTICAL TRAINING IN SCIENCE.

In Boys' Schools, Chemistry is being taught very well and always practically. The boys themselves may be found at work taking specific gravities, etc. The research method is adopted as much as possible, the Department deprecating giving boys information which they could find out for themselves. The boy is given a piece of iron and asked to find the specific gravity on the basis of principles which he has been taught. He has to record all his weighings, which are carefully checked, and the final result is arrived at and discussed and made the basis of instruction in fresh scientific principles. Much importance is attached to method in this matter.

The freedom among the schools to vary between the third and fourth years by choosing which specialized course they will take—Botany, Philosophy or Hygiene, or Geology—has been taken away and replaced by a syllabus in Commercial Geography. He believed that some of the very best teaching of Domestic Economy and Hygiene was to be found in the Girls' Secondary Schools in Ireland. The teaching in all the Catholic Secondary Schools is undertaken by religious orders, and the Nuns themselves have taken to the Department's work with the very greatest enthusiasm. They have rules which make it impossible for them to attend the summer courses in Dublin, though occasionally groups of Nuns from various convents attend at central houses where teaching is given. The teaching in Hygiene and Domestic Economy is being done extremely well in Secondary Schools.

RECORDS OF PUPIL'S PROGRESS.

The inspector pays great attention to the teacher's record of the pupil's progress, and this is one of the first things he asks for and discusses with the

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teacher. It is made a matter of friendly discussion—sometimes not so very friendly if the work is bad. More attention is paid to this record than to the work done on the day of inspection, which is more or less superficial.

Accurate records of work by the pupils are insisted upon and they are found most useful. A clear, logical statement of a result arrived at helps enormously the teaching of English, and is of very great educational value. There is no room for sloppy or ill-considered statements. The student must state precisely what results he has obtained and what inference he draws from them. Moreover, he is required to make drawings of his apparatus and thus use drawing as an aid to expression. The keeping of a notebook by the student is one of the best guarantees the Department has of the real nature of the work. It helps the student in another way, for the Department requires that the student should be registered from the beginning of the session to the close, and payment is made on that register; so that the notebook is virtually a Treasury Voucher.

DEALINGS WITH THE TREASURY.

The custom is to say to the Treasury at the beginning of the year "We estimate that we shall require £28,000,"¹ or whatever the amount may be. The grant to the schools is never trimmed to fit the estimate, and if it be a thousand pounds less, the money would go back to the Treasury; if a thousand pounds more, the Treasury is usually willing to permit a transfer from some other heading. If a school gets more or less it is neither an advantage nor a loss to the funds of the Department. Mr. Fletcher said it was a great credit to the staff that the estimates were so remarkably close.

Another point of importance is that the Department deals directly with the Secondary Schools, and not with any local authority.

For the work done through the local authorities—county and urban committees—the sum of £55,000 is available, together with the proportion of the local rate, plus the Science and Art grant for Secondary Schools. When this work was begun, there were only two or three technical schools in all Ireland; now there are 50 or 60. These are managed by local committees with co-opted members. These committees had had no experience, as Ireland was very much behind either England or Scotland, where Technical Education took a great leap through the passing of the Local Instruction Act and the Technical Instruction Act in 1890-91, when the Beer and Spirit money was made available for Technical Education. The Irish equivalent was not given to technical education, but to intermediate and primary education, which at that time was perfectly justified, as there was no machinery for the former. The Local Government Act did not pass till 1898, so that from 1891 to 1901, practically, there were ten dead years in Ireland as related to technical instruction.

HOW SCHEMES ARE FRAMED.

These local Committees in Ireland had no experience in framing schemes; but an Inspector from the Department discusses schemes with them, and these are adopted, submitted to the Board and approved, and the Committees go

to work at once. To-day every county in Ireland has a Technical Instruction scheme. That of County Cork may be taken as typical: it includes advanced evening classes, day trade preparatory classes, technical classes and scholarships for girls, domestic economy day classes, instruction in manual work and domestic economy, preparatory course of instruction, and general conditions that come into all the schemes.

While very great use is made of examinations for the purpose of deciding on the qualifications of teachers, the Department believe they can find out what work is being done in a technical school by means of inspection better than by examinations, which are entirely abolished.

LOCAL RATES AND GRANTS.

No grant is given in any county or town unless it raises a rate, and the Department is generally satisfied with a penny rate. The town of Pembroke raises twopence, and certain other towns raise more than a penny. The basis of distribution of the fund is this:—At the option of the Department the £55,000 may be divided into two portions, one portion available for the 6 county boroughs in Ireland, and the other for the rest of the country. The basis of allocation is this:—The Department, wishing to relieve any poor district of the consequence of poverty, decided to begin by making up its rate to £20 per thousand of population, so that no town would suffer from poverty in respect to the smaller amount raised by the rate; then the amounts are allocated on the rough basis of population, in some cases the principle being departed from for special reasons. That makes up the grant called the grant from Endowment. There is also the product from the rate; also the earnings from the Science and Art Department.

ITINERANT CLASSES.

From Mr. Fletcher's point of view a most important scheme is that of instruction in Itinerant Classes. The Department set to work to train teachers in manual work and domestic economy, and in special courses, running over 8 months, trained some 80 young tradesmen, and those who passed their examinations were set to work in Counties, being given salaries commencing at £120 and rising. These give their whole time. The principle is that different centres make application to the County Committee, who allocate instructors for courses extending for six weeks in daily classes. The course may be extended to three months if it is going on well, but the Department prefers a six weeks' course repeated the following year. Any old building is rented which is available and suitable, and the plan works very well, criticisms formerly heard having entirely disappeared. Young farmers and all sorts of people attend, and are taught manual instruction on rigid principles, drawing, etc., but in the strictly rural districts people are allowed to make wheelbarrows, gates and anything in the construction of which those principles may be used.

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Mr. Fletcher was afraid that manual instruction had been some shibboleth; everything that was useful was condemned; the principle of making a dovetailed joint was thought so important that its value was supposed to be lost if it were put into a piece of furniture. The Department does not agree with that. They find people in the country districts working uselessly unless they turn out something that is useful in the end; so, while the educational principle is kept in view, these rural classes are making beehives and barrows and all sorts of useful things and are putting these to the betterment of their holdings. Having got the skill, they are beginning to use it. The County Committee meets the expense of the school, other than the teaching, out of the joint fund made up of their own rate and the Department's contribution.

DOMESTIC ECONOMY TEACHERS AND SCHOLARSHIPS.

The same plan is worked in connection with Domestic Economy. These teachers get three years' training, and are available to be appointed by local committees who provide six weeks' courses of instruction for localities in the same way. Usually two sessions are held daily, say, in the afternoon from 4 to 6, and in the evening from 7 to 9. That has been found useful, because senior girls from the National Schools may attend the afternoon class outside of school hours. To prevent overlapping, a rule was made that no girls under 14 should attend, and no scholar on the roll of the Elementary School; but the classes are always attended by a number of girls who have just left school. The evening classes are very largely attended by women of the district, sometimes the ladies, sometimes servant maids and daughters of farmers, and these all work together. Mr. Fletcher attended one of these classes in the previous week, and saw the National School master's wife and the wife of a hotel-keeper and farmers' wives from a distance of four or five miles who went in every day.

The Department allows County Committees to grant Scholarships for girls, which are tenable at Schools of Domestic Science. They are worth £15, and the local Board adds £2, making £17 for board and residence. The Department has a School of Domestic Training at Killarney, which is devoted quite definitely to training in Domestic Science, and the moment these girls are trained they are immediately snapped up.

DAY TRADES PREPARATORY SCHOOLS.

The Day Trades Preparatory Schools form an entirely new type, organized by the Department. While a certain amount of English is kept on the programme, the subjects may be said to be Applied Drawing, Workshop Arithmetic, Experimental Science, Manual Instruction, with perhaps a little Commercial Instruction. These schools are worked mainly through local authorities, which send in an estimate of their probable expenses, and if approved, the Department pays three-quarters of the actual expenses as shown by vouchers, the other quarter being provided from local funds, consisting of the Department's grant plus local rates.

AID TO HOME INDUSTRIES.

The Home Industries in Ireland are such as Lace, Crochet Making, Sprigging, Knitting and Hand-loom Weaving, and the Department originally allowed grants towards teachers in these various industries, but the plan did not work well because when a class was not well attended and went down, the grant continued. The Department then gave capita grants and required that every scholar should receive instruction in Domestic Economy, which was defined, and that worked very well. In addition to that, the Department allowed County Committees to employ teachers for those home industries and lend the teacher if they liked, and that plan had worked very well, notably in Fermanagh, where there are 8 teachers who control these little home industries, mainly Crochet, Sprigging and Embroidery. Both these methods of aid to industries through County Committees have their merits.

The Department also directly encourages various home industries, though its powers are limited in this direction. Industries have been started which have arisen out of the Department's courses of Manual Instruction; but the industry known as Sprigging is a development of great interest. This consists of embroidering the corners of handkerchiefs with initials, etc. It is a very widespread industry in Ireland, but as a hand industry is undoubtedly declining, a machine having been found to do the work. The Department sent a special inspector to Switzerland to report on the machine embroidery there, and also made enquiries at home and found that three large Belfast manufacturers sent all their linen to Switzerland to be embroidered. It was taken in duty free under a special Act, and sent back to Belfast, and of course it was Irish linen. These people actually established factories in Switzerland for this purpose. There is no doubt that the work could be done in Ireland, and the Department has lately established a school at Ballydugan in the North of Ireland, to which this large Swiss machine has been brought, on which several handkerchiefs can be done at once by a simple pantograph movement at one end, and it is doing very good work. The Department is giving aid to this school, and may establish others.

The DEPARTMENT'S VARIOUS GRANTS.

The Department can give grants under 11 heads, and it is difficult to say what cannot be touched under those heads, which cover the following industries—building, metal, textile, printing and engraving processes, furniture, leather, woodworking, carriage building, electrical, chemical and agricultural.

The old Science and Art plan having proved unsuitable, the Board of Education finally allowed the Department to have its own scheme. The Department now pays a grant on attendance, and in addition gives what is called an increment grant for continued attendance in the case of individual students, which is paid on the total attendance-hours in all subjects of an approved course

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in the preparatory or specialized courses, the rate of increment per hour being as follows:—

For each hour from	21 to 40.....	One Penny.
	41 to 60.....	Twopence.
	61 to 80.....	Threepence.
	81 to 100.....	Fourpence.
	100 to 120.....	Fivepence.

No increment is paid on attendance-hours exceeding 120. This has the effect of causing the classes to keep up a good attendance, either by pressure upon the student or by giving inducements for regular attendance.

The Department has a system of inspection to ascertain whether students are really profiting by the instruction as they should. The inspector visits from time to time and sits and hears the lesson, examines the students' note books, etc. The method of written examination has been tried, and Mr. Fletcher ventured to say it had been found wanting. If a paper examination is instituted and all the students are required to go in for it as a basis of payment of grant, it would stereotype the teaching. Mr. Fletcher would like to make inspection more frequent, but the Department was handicapped by lack of inspectors, so the endeavour was made to inspect very thoroughly, each school being visited several times each session, and a school like the Belfast Institute probably twenty times each session. At the same time he frankly admitted that it would be quite possible for a class to escape, but the Department left something to the conscience of the local authority.

There is always a fight between the school that wants to get as much grant as it possibly can and the Department that wants as much efficiency as possible; and the lower standard of students coming into the schools is a handicap, so there always has to be a nice adjustment between what is possible and what is perfect.

All the Central Institutions run by the Department, such as the Metropolitan School of Art, minister to the other parts of the scheme.

LACK OF SUITABLE BUILDINGS.

When the Act was passed, no grant was made for buildings, and there is a lack of suitable technical school buildings. The work has gone on in all sorts of unsuitable premises. People in Ireland did not believe that technical education had elements of permanence. In one place Mr. Fletcher was told they would not have half-a-dozen pupils, yet on the opening night there were over 200. It was suggested that this was a flash in the pan, but they not only remained but increased in number.

Now, after 10 years, the Department is quite convinced that technical education has come to stay, and the attendance compares most favorably with towns of similar size in England. What is now needed is proper accommodation. Quite a large number of local authorities have borrowed money and built, and the Department allows the interest and sinking fund as a first charge on the

grant, so that quite a number of small townships have put up schools, and a number of buildings have been modified for technical instruction. The money which is allowed for interest and sinking fund was primarily intended for annual maintenance, and makes such a hole in the annual income as to rather interfere with educational work. Parliament has been pressed for a building fund, which is a great financial need, but this has not yet been granted. It is a question whether it is fair to ask the localities for a higher rate than one penny. They have power to borrow, and they have used it most freely, but they have not power to raise more than twopence, and some towns have reached their limit.

SCHOLARSHIPS FOR BOYS AT SCHOOLS AND TRADES.

There are scholarships for boys, tenable at Secondary Schools and paid for out of the funds of local committees. Hitherto these scholarships, which were intended for boys who were to follow industrial careers, were held in Secondary Schools, but the scheme failed, as the boys never went on to an industrial school. Now these scholarships are made tenable at Trade Preparatory Schools, which a boy may attend for two years, or he may be apprenticed, and the Department will guarantee him 15s. a week till he is out of his apprenticeship, on condition that he attends evening classes and follows the programme approved by the Department. Perhaps the first year the boy gets nothing from his employer; then the Department will give him 15s. The second year he may be paid 15s. by his employer, in which case the Department gives him nothing; but before he is apprenticed the Department has to know the terms of apprenticeship, and to some extent will be able to have terms in competition. Mr. Fletcher hoped the scheme, which had only been initiated, would work very well.

CHAPTER XXI: ORGANIZATION OF THE DEPARTMENT.

The purpose of the Agricultural and Technical Instruction (Ireland) Act, 1899, is to establish an Irish Department of State, so constituted as to be representative at once of the Crown, the local government bodies of the country, and those classes of the people with whom its work is chiefly concerned; and to give to this Authority the function of aiding, improving and developing the agriculture, fisheries and other industries of Ireland, in so far as may be proper to such a Department and in such manner as to stimulate and strengthen the self-reliance of the people.

SECTION 1: THE VARIOUS BODIES CONSTITUTED.

With this end in view, a Department has been constituted with a staff paid out of a Parliamentary vote. There have been appointed, to advise and co-operate with the Department, an Agricultural Board, a Board of Technical Instruction, a Council of Agriculture, and a Consultative Committee of Education. There have been placed at the disposal of the Department and its Boards an endowment of £166,000 per annum and some additional sums as indicated elsewhere.

COUNCIL OF AGRICULTURE.

The Council of Agriculture, constituted under Section 7 of the Act of 1899, consists of 104 members, of whom 68 are appointed by the County Councils and 34 are nominated by the Department, the President and Vice-President of the Department being *ex-officio* members.

By Section 27 of the Act the members of this Council, and of each Board established by the Act, hold office for terms of three years.

THE AGRICULTURAL BOARD.

The Agricultural Board consists of 12 persons—8 appointed by Provincial Committees of the Council of Agriculture and 4 appointed by the Department.

That portion of the Department's Endowment Fund intended for the purposes of agriculture, rural industries, and sea and inland fisheries (with the exception of a special sum of £10,000 for sea fisheries, and certain specified capital sums) must be administered by the Department with the concurrence of the Agricultural Board. In addition to their control of all such expenditure, this Board acts as an advisory body to the Department in reference to "all matters and questions submitted to them by the Department in connection with the purposes of agriculture and other rural industries."

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BOARD OF TECHNICAL INSTRUCTION.

The Board of Technical Instruction consists of 21 members, appointed as follows: 3 by the county council of each of the county boroughs of Dublin and Belfast; 1 by a joint committee of the councils of the several urban county districts in the county of Dublin, such joint committee consisting of one member chosen out of their body by the council of each district; 1 by the council of each county borough not above mentioned; 1 each, by the Provincial Committee of each Province, by the Commissioners of National Education, and by the Intermediate Education Board; and 4 persons appointed by the Department.

THE CONSULTATIVE COMMITTEE.

The Consultative Committee consists of the Vice-President of the Department as Chairman, and one person appointed by each of the following bodies:—The Commissioners of National Education, the Intermediate Education Board, the Agricultural Board, and the Board of Technical Instruction.

The function of the Committee is to “co-ordinate educational administration.” The operations of the Department as regards science teaching and technical instruction, whether as applied to agriculture or to urban industries, have an intimate bearing on the work of primary, secondary and higher education, and the success of the Department’s work must largely depend on the manner in which the various educational systems of the country are worked in harmony. This harmony it is the object of the Committee to promote.

LOCAL ORGANIZATION.

The Department is deeply convinced that in Ireland, and especially in relation to agriculture and to industries connected with agriculture, organization has an essential part to play in the economic and social elevation of the people. Indeed, it would appear as if this agency of progress had, comparatively speaking, greater possibilities here, on account of the racial capacities for associated effort which the people display, than even in countries which, with the aid of organization, have succeeded, for the time being, in driving Irish agricultural produce from its due place in the markets. The Recess Committee found that Departments of Agriculture in the countries whose competition Ireland feels the most keenly, devote a considerable part of their efforts to promoting agricultural organization, recognizing it as an axiom of their policy that, without organization for economic purposes amongst the agricultural classes, State aid to agriculture must be mainly ineffectual, and even mainly mischievous.

Thus, for the sake of efficiency in its educational work and of economy in administration, the Department would be obliged to lay stress on the value of organization. But there are other reasons for its doing so: industrial, moral, and social. Organization is itself an agency of the greatest power and, in modern economic conditions, an essential agency for the advancement of the agricultural industry, and of others connected therewith, not only rural districts,

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but undertakings in which town and country share; and by its means capital (as well as directing skill and economic management) is made available both for such undertakings and for the most minute concerns of the smallest farmers and labourers to whom the use of helpful capital is possible through no other channel.

Again, organization is perhaps the most direct means of nourishing the self-reliance and strengthening (so to speak) the moral back-bone of the people; for, through mutual help, it renders the self-help of a community at once effective and brings the intelligence of the most intelligent to assist in promoting the interests of the most backward individual who engages in the common effort. But not the least important aspect of organization for Ireland, where the isolation and dulness of rural life have something to do with the continuance of emigration, is its social side. Around every little society, through which the people of a district have been successfully working out their industrial advancement and learning the powers which combination gives the simplest and most remote of communities, even in complicated business affairs, there is an inevitable tendency for combined efforts for other purposes to group themselves. In this way opportunities and means for educational improvement and social amenity are multiplied in places where such means and opportunities did not exist before; while the faculties of the people are expanded, their hopefulness increased, and life at home on the Irish countryside is rendered more attractive.

SECTION 2: ADMINISTRATION AND FUNDS.

PRINCIPLES OF ADMINISTRATION.

Two principles of procedure are clearly indicated, as well as by the situation the Department has to deal with as by the legislation they are required to administer.

1. Administration of this kind must fail in its best result unless it seeks to evoke and fortify the self-reliance, enterprise and sense of responsibility of the people. Both economic and social laws dictate this principle.

2. In encouraging local initiative and responsibility the danger, on the other side, of an indiscriminate multiplication of unrelated local schemes must be guarded against by a due conservation of the principle of central direction. It is the duty of the Department to keep in mind the national as well as the local point of view, and to bring to bear on schemes and problems that power of co-ordination and that expert aid which the resources of a Central Authority, acting and thinking with and for the whole country, can command. The importance of this principle is well illustrated in the efficiency of the Continental systems of State aid for Technical Instruction and Agriculture, on which the constitution of this Department has been to some extent modelled.

Both these principles are provided for in the Act in such a way as mutually to strengthen each other. The Advisory Boards of the Department, who control the expenditure of its Endowment Fund, are mainly constituted by the local self-governing bodies of the country.

RELATIONS WITH LOCAL AUTHORITIES.

With a view to rendering its advice more effective and better informed, the Department considers it wise to establish, through their officers, direct and personal relations with the local authorities, societies, schools and those classes of the people generally with whom their work has to do. It is felt that correspondence alone would be an inadequate means of explaining a new and complicated Act, and of working out highly technical schemes with bodies who are under no obligation to adopt them. Hence, the Department, in the person of its representatives, has been ready to visit every local authority, confer with them on the spot, and aid them with expert advice after thorough inspection and examination of local conditions. Practically all the county councils and urban councils or Technical Instruction Committees in Ireland have thus been visited by the Department—some of these bodies many times—and very numerous personal conferences have taken place at the Department in Dublin between its officers and the representatives of local committees.

THE ENDOWMENT FUND.

The Department's Endowment Fund at present consists of an annual income of £166,000 under the Agriculture and Technical Instruction (Ireland) Act of 1899, £5,000 under the Agriculture and Technical Instruction (Ireland) Act, No. 2, of 1902, £19,000 under Section 49 of the Irish Land Act of 1909, and £7,000 from the Ireland Development Grant. From the total, amounting to £197,000, a sum of £62,000 has to be set aside for the purposes of Technical Instruction (as distinguished from Agricultural Instruction), and £10,000 for sea fisheries. A provision of about £1,000 a year has also to be made for the payment of the superannuation allowances of certain persons formerly employed under the Commissioners of National Education, and for travelling expenses of members of the Council of Agriculture and of the two Boards established by the Act of 1899.

Any portion of the Endowment Fund, under this head, not expended in any financial year is accumulated by the Department in accordance with Section 16 (4), and may be used in future years for expenditure upon general or local schemes, at the discretion of the Department and the Agricultural Board.

In addition to the Endowment Fund there are Parliamentary votes for some of the work done under the Department. In these provision is made for the salaries and other expenses in connection with the institutions and officers transferred from other departments under Section 2 of the Agriculture and Technical Instruction (Ireland) Act of 1899, as well as for salaries and expenses of officers appointed since the 1st April, 1900.

The expenditure falls into two main natural divisions: (1) Moneys which are required for the purposes of a general character, affecting the country as a whole; (2) Moneys which are required for local schemes. This distinction is duly regarded in the administration of the funds by the Department and the Board.

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AID TO LOCAL SCHEMES.

In regard to local schemes, it is of importance to have it clearly understood that aid is intended to be applied to schemes, and not to localities as such. The function of the Department is not to distribute money to localities, but to apply financial support and skilled assistance to approved schemes for giving effect to specific purposes, for the attainment of which the Department has been created. The schemes must be approved by the Department, and they must, save in exceptional cases, be aided by local contributions before the Department's funds can be applied to them. But the contribution from the Department's funds is not in any fixed proportion to the local contribution. Provided the Department and Board are satisfied that the locality does its duty, and the actual local contribution is in just proportion to the genuine capacity of the locality to contribute, they are free to aid schemes in that locality with regard only to the merits of the schemes, to the needs of the locality, and to the relation of the schemes with the general system for the country as a whole of which they are part. To such schemes in any county, or to the extension of such schemes, or to any particular feature of them, the Department's contribution may be increased or lessened in future years according as the needs of the locality, the success or non-success of parts of the schemes, the amount of the local contributions or other circumstances may determine.

That policy in respect to the contribution by the Department not having any fixed relation to the actual local contribution was modified in 1910.

In view of the increasing demands on their funds, resulting from the extension of county schemes, it was accordingly decided, with the concurrence of the Agricultural Board, that the amount of the Department's grants towards the cost of agricultural schemes should in future bear some proportion to the conditions of each county, taking into consideration valuation, population, number of breeding stock, and area under crops. This new method of distribution took effect with regard to all agricultural schemes coming into operation after 30th September, 1910, and will remain in force for five years from that date.

The net expenditure on the agricultural side of the Department's work in 1909-10, including the grant of £9,000 for the purpose of providing instruction in manual work and domestic economy in rural districts, was £117,778.

FOR AGRICULTURAL INSTRUCTION.

The grants for Agricultural Instruction, sanctioned with the concurrence of the Agricultural Board, amounted to £28,088. The votes to County Committees included £5,363 for general administration and £16,891 for Agricultural Improvement Schemes. These were outside of and in addition to grants for Live Stock schemes and shows. Altogether there are 14 main schemes in regard to which the Department co-operates with County Committees. The first seven which relate to Horses, Cattle, Swine, subsidies to Agricultural and other societies, prizes for Cottages and Small Farms, lie outside the scope of this Report. Other schemes, such as Instruction in Agriculture, Winter Agricultural Classes, In-

struction in Horticulture and Bee-keeping are dealt with. They may be taken as typical of the others. Altogether 131 instructors and instructresses are employed permanently in connection with the schemes.

FOR TECHNICAL INSTRUCTION.

Under Section 16 (C) of the Agriculture and Technical Instruction (Ireland) Act of 1899 an annual sum of £55,000, allocated for the purposes of Technical Instruction, is to be divided into two parts. It was allocated by the Department with the concurrence of the Board of Technical Instruction for the triennial period ending 31st March, 1912, as follows:—

For Technical Instruction in county boroughs.....	£26,000
For Technical Instruction elsewhere than in county boroughs, and for central purposes.	£29,000

The Board therefore control the expenditure of an annual sum of £29,000, which is applicable for technical instruction elsewhere than in county boroughs, and for certain central purposes. The balance of the £55,000 viz., £26,000, allocated (with the concurrence of the Board) for technical instruction in the six county boroughs, is applied in aid of schemes in those boroughs subject to the approval of the Department alone. Out of the sum £29,000 referred to, the Department (with the concurrence of the Board) set aside an annual sum of £4,000 for central purposes, *e.g.*, for Senior Scholarship schemes, provision for training teachers, etc. The remaining £25,000 is distributed in aid of approved schemes of technical instruction in urban and county districts.

On the whole the amount contributed by the Department from its Endowment Fund, for Technical Instruction, under 34 county and 34 urban districts and county borough schemes, amounted to £58,916 as against £29,514 from local rates. The total number of pupils in attendance was 42,909 (16,784 young men and 26,125 young women). Of these 2,948 are boys and 2,998 are girls who are still attending school.

As the funds available for the ordinary subjects of Technical Instruction are all needed for the urban schemes, the Department again found it necessary to ask the Agricultural Board to allocate a sum of £9,000 out of the funds administered with the concurrence of that Board, for Manual Instruction and Domestic Economy classes in rural districts. Such classes are regarded as part of the general scheme of Agricultural Education, but, for administrative reasons, the Department have hitherto found it convenient to administer this sum with the concurrence of the Board of Technical Instruction. Classes in lace and crochet-making, and other rural industries, are also financed from the agricultural surplus, the amount voted in 1909-10 for this special purpose being £3,000.

The grant in aid of Technical Instruction for 1909-10 commonly known as the "equivalent grant," was duly received from the Ireland Development Grant, and amounted to £7,000.

The total of the sums available in 1909-10 for Technical Instruction in non-agricultural subjects was £72,182 exclusive of the balance of £74,192 brought forward from the year 1908-09. The expenditure was £91,410, of which £41,184 was paid to the county boroughs.

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THE PARLIAMENTARY VOTES.

The expenditure in respect of the institutions maintained from the Parliamentary Votes during the year 1909-10 was as follows:—

Royal College of Science.....	£16,097
National Museum of Science and Art.....	13,568
National Library of Ireland.....	5,477
Metropolitan School of Art.....	4,360
Royal Botanic Gardens.....	4,636
	<hr/>
	£44,138

The Parliamentary Votes also provided grants for Science and Art Instruction in Ireland, payable to schools which adopt the Department's programme for Experimental Science, Drawing, Manual Instruction and Domestic Economy. The provisions made for these purposes was £48,750, an increase of £5,150 on the corresponding provision for the previous year.

From the Parliamentary Votes grants were paid as follows:—

	No. of Schools.	No. of Pupils.	Amounts.
Day Secondary Schools.....	286	13,406	£27,583
Technical Schools (mostly evening classes).....	87	8,102	18,223
Other Grants to Technical Schools.....	....	1,802	3,920
Primary Schools, for Drawing and Manual Instruction.....	95	.....	1,639

These Parliamentary Votes are outside of and separate from the amounts already referred to as available from the Endowment Fund.

CHAPTER XXII: THE AGRICULTURAL BRANCH OF THE DEPARTMENT.

INTRODUCTORY.

The term "Agricultural Branch of the Department" is used here to indicate the portions of the Department's work which are more directly concerned with education for and in agricultural and housekeeping occupations. It has not been thought necessary to describe the many useful activities of the Department in connection with schemes for the improvement of live stock by grants to bring about the use of thoroughbred animals, or subsidies to agricultural and other societies, or prizes for cottagers and small farmers.

No report will be made on the branches concerned with Fisheries, Statistics and Intelligence, Veterinary matters or Transit and Markets. Specific mention is made of the matter here lest the reader might be led to suppose that the whole of the activities of the Department of Agriculture and Technical Instruction were confined to the two branches dealt with in this Report, viz., the Branch of Agriculture in so far as it conducts or promotes education and instruction for agricultural purposes, and the Branch of Technical Instruction which is concerned chiefly with the training and instruction of workers for and in manufacturing and building industries.

When the Department was inaugurated it found itself confronted by conditions which required competent men and women as leaders and teachers in various capacities on its staff. Some men who had obtained their experience and training in England and Scotland were secured. The further need was a large number of Irishmen and Irishwomen who understood local conditions, were in sympathy with the character and needs of the various communities, and who had become competent by acquisition of further knowledge, scientific training and some practical experience in administration, to fill positions which would be assigned to them. In consequence, the principal features of the procedure which was adopted were:—

(1) The reorganization and development of the educational institutions (the Royal College of Science, the Albert Agricultural College and the Munster Institute) in existence at the establishment of the Department and transferred to their control.

(2) The postponement of the establishment of agricultural colleges and schools until the farming classes generally should be sensible of the need for more detailed and extended instruction than could be given by itinerant lecturers.

(3) The provision of facilities for training young farmers to become itinerant instructors, and for supplying qualified teachers for agricultural schools when the time for their foundation would arrive.

(4) The inauguration of a system of itinerant instruction calculated to bring the farming classes into touch with the latest advances in their industry,

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and, at the same time, to prepare the way for permanent institutions for agricultural education.

Under such a policy no first or second order of importance can be regarded as attached to any one of these features, and no one of the features did receive first attention to the neglect of others.

The following resumé of the work of the Agricultural Branch at the present time is a brief survey of what is being done in the development of each of these features.

SECTION 1: ARRANGEMENTS FOR INSTRUCTION.

Information on the Agricultural Work of the Department obtained from PROFESSOR J. R. CAMPBELL, Assistant Secretary in respect of Agriculture.

The work of the Agricultural Branch may be divided into,—

(a) That which is administered jointly by the local authorities and the Department, and

(b) That which is administered by the Department directly from the central offices.

Generally speaking, when the work is such that the county can be made the unit for the purposes of administration, and particularly where such an arrangement would enable each district to receive benefits proportionate to its contribution, the administration of the schemes is delegated to the local authority. Such, for example, is the procedure adopted with schemes for encouraging improvement in live stock and schemes of itinerant instruction in various branches of agriculture. On the other hand, work for which the county cannot be conveniently made the unit and which does not apply equally to the whole county is administered directly from the Department's offices, such, for example, as the investigation of special outbreaks of diseases of stock, the encouragement of improvement in the management of creameries, and a variety of other work and investigations to which reference will be made subsequently.

FUNCTIONS OF LOCAL AUTHORITIES.

The local authorities are the County Councils, of which there are 33. Each Council, however, for the purposes of the Department's work, appoints a Committee of Agriculture composed partly of members of the Council and partly of other persons. To this Committee the Council usually delegates full powers, subject to the approval of the Department, for the administration of the funds placed at its disposal. The County Council alone can raise a rate for the purposes of the Act.

The amount raised by the county rate is usually transferred by the County Council to the County Committee to be applied by them, subject to the approval of the Department, partly to schemes of agriculture and partly to schemes of technical instruction. In a few cases the amount to be spent on agriculture and on technical instruction respectively is specified by the County Council. In

the majority of cases, however, it is left to the County Committee to decide the proportions.

In the first year 31 out of 33 County Councils raised a rate and appointed Committees for the purposes of the Act. Every year since all the 33 Councils have done so.

RELATIONS WITH DEPARTMENT.

The relations between the Department and these Committees are very satisfactory indeed. In the first years, when the procedure was not well understood, there were administrative difficulties and delays; but all these have been largely, if not altogether, overcome, and an excellent understanding has for some years existed between the leading members of the Committees and the officers of the Department, who are constantly in conference, either at the local meetings or at the offices of the Department, to discuss the details of and the arrangements for carrying out the work.

Early in August these outline schemes are explained to, and laid before, the Agricultural Board, with a statement of the estimated amount required from the Department's funds (1) to meet the cost of central administration, and (2) to meet the Department's contribution to the funds of the County Committees. When the necessary funds have been voted by the Agricultural Board a conference at the Department's offices of secretaries of County Committees has usually been held to discuss any new provision in the schemes, and to arrange dates for meetings of the Committees which are attended by the Department's inspectors for the purpose of assisting in arranging details of the programme and finances for the ensuing agricultural year. As soon as each County Committee has decided on the schemes which it proposes to put into operation, and has provisionally allocated funds therefor, the secretary notifies the Department, who then intimate their approval as well as the maximum of their contribution for the year. Where the County Committee and its secretary are alive to the interests of the county, the work is usually in full swing by October, except, of course, such sections of it as depend on the seasons.

The appointment of local or district sub-committees who see that the district they represent takes full advantage of the schemes, is a most important factor in insuring the success of the work. The Department have urged the appointment of such sub-committees to assist the statutory committees, and hope that still more use will be made of them in future years.

The expenditure of at least half the Department's Agricultural Endowment is now in the hands of the local authorities.

Supervision of the details of this expenditure cannot be undertaken by the Agricultural Board. It therefore rests with the Department to discharge this duty. If they use their control unreasonably, they will very soon be brought to task either by the Board, who are themselves members of County Committees, and to whom the local representatives would complain if they were being improperly treated as regards funds, or by the Council of Agriculture.

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ATTITUDE TOWARDS AGRICULTURAL EDUCATION.

Of all the agricultural problems which the Department have had to solve, that of gradually leading Irish farmers to appreciate an education for their sons, who are to succeed them, has been the most difficult, and has received the most attention.

It did not require a prolonged study of the conditions of agriculture in Ireland to show that there is good reason why it would be impracticable to at once introduce methods which have proved successful in other countries. It is impracticable to bring the farmer himself to school, and therefore the only way he can be brought into contact with the application of science to agriculture is by sending round instructors to give lectures in the evenings; to visit holdings during the day and discuss privately with the occupiers the various problems which confront them in their practice. Such an officer, if he is armed with a thorough knowledge of his business, both scientific and practical, rarely fails to convince a farmer that he would have been more successful had he received an agricultural education, and that it is to his son's advantage that he should be given one. Such work, however, is slow, and even in the most progressive countries requires patience and determined perseverance. It is universal experience that the more highly educated, capable and progressive the farmer, the more he appreciates technical education.

POLICY OF THE DEPARTMENT.

The policy of the Department has been,—

(1) To provide at one central institution the highest form of technical education for the training of men who are to become teachers and specialists in agriculture. (This has been done at the Royal College of Science in connection with the farm and college at Glasnevin.)

(2) To provide at least one high-class agricultural college which would form a stepping stone to men desirous of entering the Royal College of Science, as well as men, the sons of well-to-do farmers, who wish for an education to enable them to manage their own farms, and men who desire to become creamery managers, or who wish to have a special training to fit them as horticultural or poultry experts, stewards, land agents, or other occupations in connection with agriculture. (This has been done at the Albert Agricultural College, Glasnevin.)

(3) To provide provincial institutions at which young men who can be spared from the farm for one year can be taken in as apprentices, taught agriculture, both practical and technical, at a fee proportionate to their means. (This work, which had to be delayed until teachers were trained, is now in progress at three such institutions, and the provision of others is in contemplation.)

(4) To provide winter schools of agriculture where the sons of farmers could obtain technical training at small expense during the winter months, when they can best be spared from farm work.

(5) To provide one central higher institution for the training of women in the domestic economy of the farmhouse, and in work which falls to the lot of

women to perform in connection with the farmyard, as, for example, dairying and poultry-keeping. (This provision has been made at the Munster Institute, Cork.)

(6) To provide for young women education in domestic economy and farmyard lore at residential and day schools. (This has been done at a number of institutions, while the equipment of others is under consideration.)

(7) To provide in each county, by a system of itinerant instruction in agriculture, horticulture, dairying, poultry-keeping, and bee-keeping, instruction and advice for farmers and their wives, sons and daughters who cannot avail themselves of other means of acquiring information.

A GRADUATED SYSTEM OF EDUCATION.

Thus the Department have laid the basis of a graduated system of agricultural education by means of which the youth who is inspired by the work of the itinerant instructor may be able to obtain education in the local winter school of agriculture, from which he may graduate to the provincial agricultural school, thence to the Albert Agricultural College, or the Royal College of Science, according to his circumstances and his education, and equip himself for the highest offices in connection with agriculture which the country has to bestow.

One important aspect of the question should be mentioned in this connection, viz., that the education of the agricultural student must be accelerated when the influence of the teaching of practical science in the Secondary Schools provided under the Technical Instruction Scheme comes to be more and more felt. It may be taken for granted that the boy who has had a training in practical science in the Secondary School will benefit more by his attendance at the lectures and demonstrations of the agricultural instructor, at the classes in the winter schools, and at the provincial institutions, than the boy who goes to these without this preliminary training.

SECTION 2 : ALBERT AGRICULTURAL COLLEGE,
GLASNEVIN.

This College is being used to train teachers and leaders for what may be called the extension schemes of the Department, carried out in co-operation with local authorities. The entrance examination and supplemental entrance examination, held in September and October, 1909, were attended by 60 candidates—this number and that of students admitted showing a substantial increase as compared with the previous session. Five students of the College obtained Scholarships in Agriculture, tenable at the Royal College of Science. The number of students at the College during the years 1909-10 was as follows:—

Agricultural Course.....	35
Horticultural Course.....	7
Royal College of Science students.....	16
	—
Total.....	58

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28 men trained at this College are now employed by the Department in connection with its work.

Although the reorganization of the agricultural institutions taken over by the Department in the year 1900 was at once proceeded with, and provision made for training instructors and teachers, it has not yet been found possible for these institutions to meet fully the demand for qualified persons to take up the work of the various schemes. In 1909-10 several County Committees had again to be disappointed in their expectation of obtaining instructors trained by the Department. The number of persons so trained, who were employed by County Committees or by the Department, now amounts to 81, in addition to the 52 women who have been trained at the Munster Institute.

The College is situated on the north side of Dublin in a healthy situation, about 170 feet above the sea level. It is easily reached by tram to the Glasnevin terminus, from which it is distant less than a mile. The College consists of a residence for between 50 and 60 students, together with a farm, orchard and gardens, all covering an area of about 180 acres.

ADMISSION, STAFF, DIPLOMA, ETC.

Admission to the College is conditional on passing the entrance examination and furnishing evidence of good health and character. Only resident students, prepared to stay the whole session and to take the full curriculum, are admitted. They must not be less than 17 nor more than 30 years of age on 1st September.

The staff consists of Principal, House Masters, Agriculturalist, and teachers of chemistry, botany, zoology, veterinary hygiene, horticulture, dairying, poultry-keeping, bee-keeping and woodwork. A competent Drill Instructor attends twice weekly to see to the physical training of the students.

The clergy of the different denominations also visit the College weekly to give religious instruction. The domestic comfort and bodily health of the students are under the care of an experienced matron.

The College diploma is awarded partly on the result of the sessional examinations and partly on the work done throughout the year. It is of two classes, the first being reserved for those students who add to an intelligent grasp of scientific principles a high standard of skill in practical farm work.

Every encouragement is given to the pursuit of athletics and to the development of social intercourse among the students.

The College Discussion Society meets frequently throughout the session. The papers read before it relate to topics of current interest to the farming community.

The library is supplied with standard works on agriculture, and copies of the best farming periodicals are procured regularly for the students' use.

Prizes are given by the Department for progress made, for work done, and for services cheerfully rendered the common weal. These prizes are awarded after consultation with the Principal, and not merely on marks obtained at the examination.

COURSES OF INSTRUCTION.

The College provides two distinct courses of instruction—one for farmers, the other for gardeners. The former or Agricultural course occupies in the Department's scheme of agricultural education a position intermediate between the instruction given at the Agricultural Stations and that provided by the agricultural faculty at the Royal College of Science, Dublin. The Horticultural course is intended for selected pupils who are seeking to qualify for the post of Instructor in Horticulture.

AGRICULTURAL COURSE.

This course is intended for young men who desire a technical and practical knowledge of agriculture, to fit them for entrance to the Royal College of Science, for becoming farmers, or for engaging in any other occupation, such as creamery management, which requires technical training in the sciences underlying agriculture. It includes instruction in agriculture in the classroom, farmyard and fields, supplemented by lessons in dairying, horticulture, poultry management, bee-keeping and veterinary hygiene. The elements of physics, chemistry, botany, zoology, and entomology are taught so far as is necessary to the proper understanding of the principles underlying the most approved farm practice.

Instruction is also given in book-keeping, surveying and woodwork, while literature, mathematics and drawing receive such attention as is found requisite.

The subjects included in the examination for admission are as follows:—

(1) English, including dictation and composition; (2) Arithmetic, including calculations requiring a thorough knowledge of weights and measures, decimal and vulgar fractions, percentages and interest; (3) Mathematics—the elements of mensuration and algebra to simple equations; (4) Agriculture—the questions on this subject are framed with a view to testing knowledge acquired by practical experience of farm work. No text-book is prescribed or recommended. The examination may be oral as well as written.

The fees for tuition, board, residence, laundry, and ordinary medical attendance during the session are:—For students whose parents or guardians derive their means of living mainly from farming in Ireland, £15; for students other than the foregoing, £50.

HORTICULTURAL COURSE.

This course is suited for men who have already had experience in fruit-growing and general gardening, such as can be obtained by working for four or five years under a fully qualified gardener. In addition to the practical work in the gardens, class-room instruction is given to the pupils to enable them to understand the scientific principles underlying horticulture.

Applicants for admission must be at least 20 years of age on the 1st October, in good health and of strong constitution, and should have received a fair general education.

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The subjects included in the examination for admission are:—

(1). English—to be tested by dictation and a short letter.

(2). Arithmetic—the first four rules, simple and compound; a knowledge of weights and measures and percentages.

(3). Practical fruit-growing and gardening.

A high standard in English or arithmetic is not expected. The examination in practical fruit-growing and gardening covers the whole range of these subjects.

Pupils receive an allowance of 18s. per week during their first session and of 20s. per week during their second session.

When in receipt of these allowances they are required to find their own board and lodging. In the event of lodging accommodation being provided for them at the College the allowances are modified.

Pupils of the Horticultural School are subject to the conditions under which the gardeners at the College are employed.

The Department does not undertake to employ or to procure employment for the pupils at the close of the course, but the names of those who qualify are sent to County Committees of Agriculture with an intimation that they are eligible for appointment by such Committees to instructorships under the Department's scheme of Instruction in Horticulture and Bee Keeping.

SECTION 3: AGRICULTURAL STATIONS FOR FARM APPRENTICES.

While the operation of the schemes of itinerant instruction was being extended advantage was taken of such opportunities as arose for providing more intensive forms of instruction by means of permanent Agricultural Stations for the training of Farm Apprentices, and by 1909-10 three new Stations and one residential Agricultural School for boys had been established. These Stations are most serviceable in the training of young farmers to become itinerant instructors, although it is desired that they should also have some training at the Albert Agricultural College.

There are three such Stations in Ireland, one at Ballyhaise, County Cavan, another at Athenry, Co. Galway, and a third at Clonakilty, Co. Cork. The latter was visited by the Commission.

THE STATION AT CLONAKILTY.

Young men who intend to follow the farming profession and who desire to acquire a practical knowledge of its several branches are admitted to the Station as apprentices.

The farm is managed by an experienced agriculturist under whose direction the apprentices are required to take part in all the work of the fields and of the farmyard, whether in connection with seasonable operations or permanent improvements. In the class-room attention is given, in the evenings and at

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other times when outdoor work is not pressing, to English, Arithmetic (including Surveying), Book-keeping and Technical Agriculture. This instruction is not intended as a preparation for any examination. It is of such a character as to continue the general education of the apprentices, and be useful to them in their future career as farmers.

The applicant for apprenticeship must be not less than 17 years of age on the 1st October, and must give an undertaking that it is his intention to become a farmer in Ireland. He must also provide evidence of a sure prospect of obtaining a farm of his own or *bona fide* occupation on a farm. Admission is conditional on passing the entrance examination, producing certificates of good health and character, and paying the required fee. Preference is given to applicants from the Province of Munster, especially those who have attended a course of instruction under the Department's scheme of Winter Agricultural Classes. The latter are exempted from entrance examination provided their attendance and progress at the Agricultural Classes were satisfactory. It will also be a recommendation if the applicant produces a certificate, from the itinerant Instructor in Agriculture for the county in which he resides, that he has taken advantage of the Instructor's lectures and demonstrations and has shown a desire to improve his knowledge of tillage farming. The apprentices are required to reside in the buildings attached to the station, where they are in the charge of a House-Master and Matron. The session runs from October till the following September.

Fees for apprentices whose parents or guardians derive their means of living mainly from farming in Ireland are proportional to the aggregate tenement valuation of their holdings, as follows:—

Where the aggregate valuation does not exceed £20, £3 per Session;

Exceeds £20 but not £40, £6 per Session;

Exceeds £40 but not £100, £10 per Session;

Exceeds £100, £15 per Session;

Apprentices not included in foregoing classes, £20 per Session.

The farm at Clonakilty contains about 350 acres, and is rented by the Department from the trustees in whose care it is at the rate £280 per annum. The Department spent for buildings and equipment about £2,500, and the net annual maintenance costs the Department from £1,700 to £1,800. The Farm Superintendent expected the farm revenue to exceed the farm expenditure by £400 per annum. The latter did not include the expense of management, or the salaries of the instructors.

STUDENTS AND THEIR WORK.

30 students are received per annum, 3 of whom are kept on from the previous year. The course is for one year. During the summer the students give practically their whole time to outside farm work, except in weather unfit to be out. Taking the course as a whole, about one hour per day is devoted to class-room instruction. There is no laboratory. There are specimens for illustration purposes, and also a good working room with benches and tools, where students are taught to do simple carpentering.

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Of the 27 first-year students in attendance, 21 had previously taken one of the Winter Agricultural Courses of 16 weeks, such as are referred to under a subsequent heading.

The farm had the appearance of being well managed. The students had excellent opportunities for observing the best processes in farm practice, and for being trained into ability to do the work well themselves.

It occurs to the Commission that Agricultural Stations similar to this would be a benefit and advantage, particularly in those districts of Canada where the settlement is new, and where the working farmers and young people have not had opportunity of becoming skilled in farm work and have had little experience in farm management. In the older districts, where Illustration Farms have been selected, a development which would not be costly, and would likely be of decided benefit, might come through places being arranged for from 3 to 10 farm apprentices on each suitable Illustration Farm.

SECTION 4: ITINERANT INSTRUCTION IN AGRICULTURE.

The schemes of Itinerant Instruction constitute part of the County Schemes for Agricultural Instruction carried out by the County Committees of Agriculture and the Department co-operating together.

The Department's scheme of instruction in agriculture was again put into operation by each County Committee in 1909-10. 36 instructors were employed, there being no increase in the number at work during the previous year. The County Committees of Cork, Tyrone and Wexford each employed two instructors.

The number of instructors in agriculture employed each year under this scheme, since the establishment of the Department, may be observed from the following table:—

Year.	No. of Instructors at work
1900-1.....	3
1901-2.....	10
1902-3.....	10
1903-4.....	17
1904-5.....	21
1905-6.....	23
1906-7.....	30
1907-8.....	34
1908-9.....	36
1909-10.....	36

During the season, from October to March, 826 lectures were delivered at 390 centres, at which close on 41,000 persons attended, giving an average of about 50 for each lecture. These figures show a considerable decrease when compared with those for the years 1907-8 and 1908-9, owing to the fact that 24 of the instructors were employed in teaching Winter Agricultural Classes as compared with 10 in 1907-8 and 19 in 1908-9. The instructors paid 13,531 visits to farms, an average of 377 visits for each instructor. Upwards of 671

field experiments and 2,036 demonstrations were conducted by the instructors. These experiments and demonstrations are distinct from the demonstrations conducted in congested districts by the Department's overseers.

Every instructor, except two, was engaged for some weeks during the summer in judging under the Department's scheme of prizes for cottages and small farms, in a county other than that in which he was employed as instructor. The instructors also assisted in work under the Department's dairy cattle registration scheme, and in performing certain duties in connection with the Fertilizers and Feeding Stuffs Act.

ITINERANT INSTRUCTORS.

At the outset, schemes of itinerant instruction in Agriculture, Horticulture, Poultry-Keeping and Butter-making were proposed by the Department for adoption by County Committees of Agriculture. These schemes were put into operation by the majority of the Committees as soon as qualified persons were available to take up the instructorships. The schemes have remained substantially the same throughout the decade, but have been revised each year and their scope extended in directions pointed out by experience gained at the work. The number of instructors has increased steadily from year to year. At the close of the year under review each county committee of agriculture, with one exception, had several schemes in operation. In the great majority of counties all four schemes were working, and in several counties a second and even a third instructor was employed under one or more schemes. The number of instructors at work was as follows:—

Instructors in Agriculture.....	36
“ Horticulture and Bee-Keeping.....	36
“ Poultry-Keeping.....	33
“ Butter-Making.....	33
Total.....	138

The total shows an increase of 10 as compared with the previous year.

Besides the instructors employed by County Committees of Agriculture under the schemes mentioned, there are several Agricultural Overseers and Assistant Overseers employed directly by the Department to carry out the special schemes of agricultural development in the poorer districts of the West. The Department were enabled during 1909-10—owing to the additional funds for agricultural work in congested districts provided by the Irish Land Act, 1909—to increase by 13 the number of Assistant Agricultural Overseers. 43 Overseers and Assistant Overseers are now at work in these districts.

WINTER AGRICULTURAL CLASSES.

The Agricultural Classes are held during the four winter months, and provide from 30 to 40 days of instruction. The minimum daily duration of a class is 4 hours.

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The scheme of Winter Agricultural Classes in 1909-10 was adopted by County Committees of Agriculture in 26 counties out of a total of 33 in Ireland. 70 classes were formed under the schemes and 1,166 students were admitted. As compared with previous years, there was an increase of twenty classes, and of almost 300 students.

These classes are directly helpful to young farmers who are to continue working at their farming occupations. They also provide an excellent beginning in systematic instruction for young farmers who have natural aptitudes for service as instructors and leaders to begin their course of preparation. The instructors and others in charge are always on the look-out for promising young men and women to be guided towards further preparation for public service in connection with the Department and its work.

The following tables indicate the extent to which Agricultural Classes have been availed of in each year since their inception:—

Year.	Number of Classes.	Number of Students.
1902-3.....	2	44
1903-4.....	7	161
1904-5.....	18	317
1905-6.....	25	422
1906-7.....	28	449
1907-8.....	33	529
1908-9.....	50	875
1909-10.....	70	1,166

HORTICULTURE AND BEE-KEEPING.

The schemes of instruction in horticulture and bee-keeping were adopted in every county except two. The Tipperary (S.R.) County Committee, however, made provision for instruction in horticulture only.

Of the 36 instructors employed during the year, 29 were qualified to give instruction in horticulture and bee-keeping, 4 were qualified in horticulture only, and 3 in bee-keeping only. In 3 counties separate instructors were employed for horticulture and for bee-keeping respectively.

An instructor's duties under this scheme, although confined mainly to giving practical demonstrations in gardens, orchards, etc., in the planting, pruning, grafting, and spraying of trees, etc., include the delivery of lectures to a limited extent. During the year 330 such lectures were given at which there was an average attendance of 47, and the number of visits and demonstrations at gardens, orchards and selected plots amounted to 25,589.

The number of demonstration plots established in 1910 in connection with this scheme was 286 as compared with 270 in 1909—the plot holders evincing a keen interest in the cultivation of their plots. The Department hope that in future all such plots will be established principally on labourers' holdings.

As in previous years the Committees again made provision for assisting farmers and others in procuring reliable forest and other trees. The Department inspected the stocks of the principal Irish nurseries, and furnished the several County Committees with particulars of the classes of trees approved at each nursery. The Committees then usually invited tenders for the supply of trees

to residents in the county. All trees were purchased subject to the approval of the instructors, and by this means the applicants were protected from having unsuitable trees supplied to them.

POULTRY-KEEPING.

Schemes for encouraging improvement in the poultry-keeping industry were in operation in every county save Dublin. 33 instructors were employed, 14 of whom were also engaged for a portion of the year in connection with the scheme of instruction in butter-making.

The scheme of tutorial and practical classes was adopted by 22 County Committees. The instruction at these classes, which covered a period of 12 months, is essentially of a practical nature and includes discourses aided by demonstrations followed by practical and class work in which the pupils take part. Visits by the instructor to the poultry-runs of pupils and others in the district is also an important feature of the work. The instructors gave 588 lectures, at which there was an average attendance of 56 pupils. In addition, 1,522 classes were held with an average attendance of 11, and 10,198 visits were made to poultry-keepers.

BUTTER-MAKING.

The scheme of instruction in butter-making was continued during 1910. The Committees of 26 counties adopted the scheme and employed 33 instructors, of whom 14 were also engaged during a portion of the year giving instruction in poultry-keeping.

In addition to making 7,703 visits to private dairies, the instructors gave 128 lectures, and conducted 4,093 dairy classes in 305 centres where courses (extending from 2 to 4 weeks) were held, with an average attendance of 8.

The following statement shows the number of counties in which instructors have been employed each year since the inception of the scheme:—

1900-1.....	1
1901-2.....	4
1902-3.....	11
1903-4.....	18
1904-5.....	22
1905-6.....	24
1906-7.....	24
1907-8.....	24
1908-9.....	26
1909-10.....	26

SECTION 5: AGRICULTURAL SCHEMES.

Full information regarding each of the Agricultural Schemes agreed upon between the Department and the Board is published and made available to all concerned or interested.

There are 14 main schemes in regard to which the Department co-operates with the County Committees. Altogether 131 Instructors and Instructresses

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are employed permanently in connection with these schemes. Information is here given on schemes, typical of the others and useful for Canada, such as Scheme No. 9, Instruction in Agriculture; Scheme No. 10, Winter Agricultural Classes; Scheme No. 14, Instruction in Horticulture and the Management of Bees. Certain other schemes, which relate to horses, cattle, swine, subsidies to agricultural and other societies, prizes for cottages and small farms, are not considered to be within the scope of this Report.

DUTIES OF COMMITTEES.

It is the duty of the County Committee to select suitable centres at which classes are to be held, and to appoint at each centre a Local Committee, with an Honorary Secretary, who will be responsible for the local arrangements necessary for the proper carrying out of the work, and who will be required to comply with the conditions set out. The Local Committee at each centre should undertake to have posters and handbills, which will be supplied by the Secretary of the County Committee, effectively displayed in the neighbourhood of the centre. Copies of these posters and handbills should be forwarded to the Department at least a week prior to the commencement of each class. The Local Committee is responsible for securing a lecture-room, and for the heating, lighting, etc. of the same. The Local Committee should appoint a representative Chairman for each lecture, and be responsible for distributing the syllabus prepared by the lecturer.

In selecting centres, the County Committee should have particular regard to districts in which lectures or classes may not have been held in previous years.

INSTRUCTION IN AGRICULTURE (SCHEME No. 9).

The Department are prepared to approve of the appointment of at least one properly qualified Instructor in Agriculture for each county in Ireland, his remuneration, except in special cases, not to exceed £200 per annum (inclusive of maintenance and hotel expenses) in addition to travelling expenses.

The duties of the Instructor, who should take every opportunity of discussing with farmers matters affecting their interests, are:—

(a) to conduct such experiments and demonstrations in spring and summer as may be approved by the Department, to select suitable land for the purpose—to supervise the sowing of the seeds and manures, and the keeping of the plots free from weeds—to weigh the produce, tabulate the figures and prepare a report on the results;

(b) to deliver lectures on agricultural subjects, such as soils, manures, seeds, pastures, crops, and their cultivation, and the breeding, feeding, and management of live stock, especially of dairy cattle;

(c) to visit farms;

(d) to reply to letters from farmers seeking information;

(e) to advise farmers (i.) how they can take advantage of the Department's Seed Testing Station, (ii.) as to the planting of forest trees for shelter and ornament, (iii.) how they can best avail themselves of all approved county schemes, and (iv.) how they may take advantage of agricultural co-operation;

(f) to make known the provisions of the Fertilizers and Feeding Stuffs Act, and of the Destructive Insects and Pests Acts;

(g) to furnish to the County Committee and to the Department, as may be required, reports on the progress of his work and on matters relating to the agricultural industry of the county; and

(h) generally to give his whole time to the work and to do all in his power to further the interests of agriculture in the county.

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The Instructor may also be required (a) to assist in the teaching of winter agricultural classes, (b) to assist in carrying out the provisions of the scheme for the registration of dairy cattle, by the weighing and testing of milk, etc., and (c) to act as judge in connection with the scheme of prizes for cottages and small farms in a county other than that in which he acts as Instructor.

The Instructor shall make arrangements to have experimental and demonstration plots in his section or circuit and during the summer months meetings of farmers should be held at these plots to discuss the objects, etc., of the plots. In selecting sites for plots preference should be given to localities in which agricultural classes have been held during the preceding winter.

During the winter months, viz., from the beginning of October to the end of February, the County Committee should arrange for one or more lectures in each circuit, on the results of the experiments.

The County Committee may make such regulations as they think necessary with regard to— (a) the maximum age of students to be admitted to the classes; and (b) the admission to classes of students who have previously attended similar classes, provided that admission to an elementary class shall not be approved in the case of any student who has attended two previous classes.

The classes shall be confined to young men over 16 actually engaged in farm work in the county. Not more than 24 students shall be admitted at any centre and if the number of students eligible is less than 10, no class is held, but with approval of the Department, the County Committee, if a sufficient number over 16 is not available, may admit young men over 15.

No fee will be charged for the course. Students must provide, at their own expense, note books and other stationery, as directed by the teacher.

Students who reside beyond a radius of 4 statute miles from the class centre will, at the end of the course, be allowed the cost of third-class railway tickets, or one penny for each mile travelled by road, provided that their attendance and progress are regarded by the Department as satisfactory. No student will be regarded as having attended satisfactorily who shall not have been present at five-sixths of the meetings of his class, unless his absence shall have been due to illness or other unavoidable cause.

SYLLABUS OF THE COURSE.

Brief sketch of origin and formation of soils. Conditions influencing fertility. Soil improvement by draining, liming, etc.

Study of a plant, and the function of roots, stem and leaves; modification of these organs. Elements of plant food and their relative importance from an agricultural point of view. Conditions affecting the development of plants. Examination of the habits of growth and duration of the principal crops and weeds found on the farm, and the practical application of this knowledge.

Farmyard manure: its storage and application. Organic and artificial manures. Composition, description and identification of artificial manures; their valuation, time and manner of application. Mixing manures. Fertilizers and Feeding Stuffs Act.

Rotations. Cultivation, seeding, manuring and harvesting of the principal farm crops. Forage and Cattle crops. Study of the commoner insect pests and fungoid diseases of crops.

Characteristics, duration and adaptability for various purposes of grasses and clovers in farm practice. Identification of the different species and varieties.

Identification of farm seeds and the commoner impurities and adulterants. Germination and purity tests, how performed; the inferences to be drawn therefrom. Change of seed. Grass seed mixtures. Weeds and Agricultural Seeds Act.

Care and management of various classes of farm stock, with special reference to breeding, feeding and housing. Principal breeds of live stock and their characteristics.

Constituents of foods; their respective functions and value in animal nutrition. Valuation; manurial value. Description and uses of home-grown and purchased feeding stuffs. Impurities and adulterants. Rations for various classes of farm stock. Methods of using foods.

Secretion of milk; composition; conditions influencing the quality and quantity of the milk yield. Care and treatment of milk for new milk trade or butter-making. Cream ripening. Milk records. Respective merits and demerits of the several systems of dairying. Summer and Winter dairying.

Rules for estimating the areas of the principal geometrical figures met with in chain surveying and farm calculations. Field book, method of entering measurements; calculation and computation of areas. Practical work with the chain in the field. Plotting from the field book to given scales. Location of drains, etc., on the plans for future reference.

Method of keeping a diary, cash book, and a record of credit transactions. Farm valuations and stocktaking. Balance sheets: their interpretation. Estimates of the cost of various farm operations, etc.

A course in Veterinary Hygiene intended to indicate the treatment to be adopted in cases of accidents to or simple ailments of farm stock, and to enable students to carry out intelligently the instructions of the Veterinary Surgeon. To this end demonstrations regularly follow class work.

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WINTER AGRICULTURAL CLASSES (SCHEME No. 10).

The County Committee may employ as teacher for Agricultural Classes for four days per week, the Itinerant Instructor in Agriculture who has previously worked in the county, if approved by the Department. He is to devote the remaining two days per week to duties in connection with the scheme of itinerant instruction in Agriculture. Or they may employ an approved teacher or assistant instructor who would devote his whole time to the classes.

The aim of the instruction is to impart such knowledge as is capable of direct practical application to farm work. The subjects taught will be:—Soils, tillages, manure (natural and artificial), seeds, grasses, weeds, treatment of pasture, cropping, management of live stock (including winter dairying), valuation of manures and feeding stuffs, simple farm account keeping, mensuration, elementary chain surveying, and elementary science explanatory of principles underlying ordinary farm practice. As far as possible the lesson should be illustrated by practical demonstrations.

At each centre special attention will be devoted to farm calculations in connection with cost of growing crops or raising stock, with direct reference to the practice prevailing in the district.

The County Committee may arrange for a few outdoor demonstrations in the planting and after-treatment of fruit trees, to be given to students by the County Instructor in Horticulture, but no lectures on horticulture shall be given.

In order to bring the classes within the reach of as many young men as possible, it will be necessary for the teacher in each county to give instruction at two or three centres, at each of which he shall attend for *three* or *two* days weekly, during a period of about 16 weeks, from November to March. Unless in exceptional circumstances, centres at which agricultural classes have been held previously shall not be selected under this scheme.

In fixing the days of the week on which the classes are to be held at any centre, the County Committee should have regard to the dates of fairs and markets, as well as to any local circumstance which might interfere with attendance of students on certain days.

INSTRUCTION IN HORTICULTURE AND THE MANAGEMENT OF BEES
(SCHEME No. 14).

The Department are prepared to approve of the appointment of at least one properly qualified Instructor in Horticulture and Bee-keeping for each county in Ireland at a salary of £2 per week.

The Instructor's duty is to give demonstrations and, if approved, to deliver lectures on horticultural subjects, such as soils, manures, vegetable, fruit and flower cultivation, plant diseases, and insect pests—to visit gardens and orchards, and give practical demonstrations on spraying, planting, pruning and grafting of fruit trees—to conduct such experiments and other demonstrations in the spring and summer as may be approved by the Department—to select suitable land for this purpose—to supervise the sowing of the seeds and manures, and the keeping of the plots free from weeds—to give instruction in the principles and practice of modern bee-keeping—to deal with diseases of bees, plants, and trees—to advise farmers, cottagers, and others interested in land, as to the planting of trees, etc., for shelter and ornament—to reply to letters from those seeking advice on horticultural and bee-keeping subjects—to give practical outdoor demonstrations to students attending winter agricultural classes—to report to the Department and to the County Committee on the progress of his work either weekly or otherwise, as may be required: and generally to give his whole time to the work and to do all in his power to further the interests of horticulture and beekeeping in the county.

He will be required to carry out such duties as may be assigned to him in connection with any Orders issued by the Department under the Destructive Insects and Pests Acts, reporting to the County Committee names and addresses of persons in possession of bushes on which he has detected, or has reasonable grounds for suspecting, the existence of any disease or pest referred to in such Orders; also all cases of foul brood which may come under his notice; and shall act as Inspector of the County Committee for the purpose of Bee pest prevention regulations.

For the purpose of this scheme, the county shall be divided into circuits (except where the Instructor gives instruction in Bee-keeping only, in which case he will attend at centres applying for his services). He shall give outdoor demonstrations for 4 weeks in each circuit; visit gardens, orchards or apiaries in the district and give such information on practical subjects as the circumstances of the case may suggest.

Each demonstration will be followed by a discussion, during which persons interested in horticulture and bee-keeping will be invited to ask questions. Where a course of lectures has already been given a new syllabus should be presented. The County Committee may purchase fruit, forest and other trees, shrubs or plants in bulk and re-sell them, at cost price including carriage, to farmers and other residents in the county. As trees and plants infested with disease have been imported into Ireland, County Committees must invite from Nurserymen tenders for the supply of trees, etc., to be guaranteed free from disease, and before acceptance submit such tenders to the Department for examination on or before January 1st, each year. The horticultural demonstrations should commence early in autumn and be continued throughout the whole year.

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In each circuit one demonstration plot may be provisionally selected for the purpose of growing vegetables, fruit, and flowers, and showing improved methods of cultivation, but no new plots shall be selected in a county if a sufficient number of suitable plots have been established in previous years.

New plots a quarter of an acre in extent are recommended. They must not be less than one-eighth of an acre and must be established at a convenient center adjacent to a main road.

The aspect of each plot and the nature of the soil must be suitable for vegetable growing and fruit cultivation. Necessary improvements, such as drainage, must be carried out, and when required, farmyard manure must be supplied by the plot owner without expense to the Committee. The owner of the plot must sign an undertaking to continue the plot for three years. The necessary labour must be given gratuitously by the persons providing the plots—the produce to be their property.

The cost of trees, etc., required for planting a new plot must not exceed £2.

(The Department recommends that allotments attached to labourer's cottages should be selected for the establishment of new demonstration plots subject to the foregoing conditions.)

SECTION 6: AGRICULTURAL OVERSEERS.

Besides Instructors employed by County Committees of Agriculture under such schemes as have been mentioned, there are a number of Agricultural Overseers and Assistant Overseers employed directly by the Department to carry out the special schemes of agricultural development in the poorer districts of the West.

The Irish Land Act of 1909 extended the area scheduled as congested, and provided for the payment to the Department of a sum of £19,000 per annum for the purposes of agricultural development in the districts scheduled as congested. In 1910 there were employed in connection with the Department's special schemes of agricultural instruction in the congested districts, 5 Agricultural Overseers and 38 Assistant Overseers.

The work which they carry on is generally illustrated by what follows regarding the work for "colonists" at Castlereagh. They arranged for the establishment and supervision of not less than 9,579 special demonstration plots in the congested districts. These were demonstrations in the growth of potatoes, oats, barley, wheat, rye, turnips and mangolds, garden vegetables and grass, and also in the use of artificial manures in connection therewith.

They also encouraged the occupiers to spray their potato plots, and transacted for the Department the business of supplying hand-spraying machines to occupiers of small holdings in districts where such articles were not readily procurable through local agencies at reasonable prices. During the 4 years 1907-10, 5,946 hand-spraying machines were sold in that way. The Overseers also undertook the repair of spraying machines that were out of order, the necessary repair parts being supplied by the Department at cost price. During the year, 5,080 machines were thus repaired.

WORK IN CONGESTED DISTRICTS.

The Commission visited a locality about three miles distant from Castlereagh, to see a number of new holdings created under recent Land Acts, and to see something of the work of agricultural instruction for such "colonists".

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In this area about 200 holdings of about 30 acres each had been created. The land formerly was part of a large pasturage area, and under the present holders is being tilled to a very considerable extent. One of the small farmers had $12\frac{1}{2}$ acres of his holding under forage or hoed crops. On the whole, the crops were of good quality and evidently well put in.

The local Agricultural Overseer spends his whole time among about 150 holders, there being about 50 holdings uncompleted at the time of the visit of the Commission. The Overseer helps them to begin the use of new implements and machines, such as chilled ploughs, cultivators, mowers, etc. The "colonists" were also given some assistance by the Department to enable them to obtain such machinery. When a new machine was to be started or put to use, a number of the neighbouring farmers would come to one place to learn all they could. When there was no such work to do, the Overseer would visit about 10 farms daily, offering counsel, answering questions and helping the people to understand the difficulties of their occupation, and how to meet them successfully. This Overseer had attended one Winter Agricultural Course of 16 weeks, and formerly managed a large farm for some four years in the County of Cork. He began his work as Overseer at a salary of £65 a year, and is now receiving the maximum for that class, which is £100 a year. The Overseers are not used by the Department to conduct Winter Classes, to hold meetings or to give any other instruction than that imparted to the farmers on their own places. Those who are engaged for the higher posts are required to be trained further, usually at Albert Agricultural College, and for the highest posts at the Royal College of Science.

SUGGESTIONS FOR NEW CANADIAN SETTLEMENTS.

It appears to the Commission that the employment in Canada of Agricultural Overseers and Special Instructors for districts where settlement is just going on would be most advantageous. Farmers would have someone to advise them how to manage most advantageously with the fewest mistakes and the least risk of loss under the new conditions. They could be shown how best to use new kinds of machines and implements. The prevention of waste of time, disappointment from partial failure at first, and direct losses, would all accrue to the credit of a well-administered system of Agricultural Overseers and Instructors and to the immense advantage of the localities. Such overseers should have had successful experience in actual farm work and management, and have sufficiently advanced agricultural education to enable them to explain correctly and clearly the underlying principles of the ordinary farm operations.

SECTION 7: INSTITUTIONS FOR WOMEN AND GIRLS.

THE MUNSTER INSTITUTE, CORK.

In close association with its work of agricultural education for boys and men, the Department has an extensive programme of agricultural education for girls and women.

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It maintains the Munster Institute at Cork more particularly for the training of teachers for agricultural schools for girls, and of county instructresses in poultry-keeping and butter-making. Four teachers are employed. Four sessions are held at the Institute during the year, and in 1909-10 were attended by 204 pupils, including those admitted to the second, third or fourth sessions. At the end of the year there were 213 applicants waiting their turn for admission. 56 pupils can be admitted at each session. In 1909-10 ten students passed their final examinations, including two instructresses who attended supplementary courses in poultry-keeping and butter-making respectively. Eight students of the Institute obtained employment in connection with the Department's work, and the number of past students so employed amounts to 52.

The outstanding features of the Institute on the occasion of the Commission's visit were the earnestness and enthusiasm alike of the Staff and Students.

The classes at the Institute are open to female students only.

COURSE OF TRAINING.

The course of training includes:—

(1) The practice of dairy-work. The treatment of milk and the making of butter on a large and on a small scale with the most modern machinery and utensils, as well as with the appliances generally used in farm dairies.

(2) Instruction in the feeding and management of cows, calves and pigs; in the keeping of small gardens and in the manipulation and care of bees.

(3) Instruction in poultry-keeping. Breeds; their suitability for different purposes and different localities; housing, feeding and management; grading and packing of eggs; hatching and rearing of chickens; fattening, killing, plucking, trussing and preparing for market.

(4) Instruction in domestic work, embracing plain cookery, plain needle-work, laundry work, and home nursing.

The fee for tuition, board and lodging during one term is £3: 3s., payable on entrance.

Four terms, each of about eleven weeks, commencing respectively in January, March, July and October, are held in each year.

CONDITIONS OF ENTRANCE, STUDY, ETC.

Intending students must be at least 17 years of age on date of admission. They are required to produce certificates of good health and character and to show that they have received sufficient general education to enable them to follow the course.

ULSTER DAIRY SCHOOL, COOKSTOWN.

The Department also maintains a Dairy School at Cookstown in the Province of Ulster, which is conducted on the same lines as the Munster Institute, with the exception that finishing courses for instructors and teachers in training are held at Cork only. Students of the Ulster Dairy School who qualify for these courses are transferred to the Munster Institute at Cork.

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Four sessions of the School were held in 1909-10, and 120 students attended, a large proportion of them coming from counties outside the Province.

SCHOOLS OF RURAL DOMESTIC ECONOMY.

There are nine other Schools of Rural Domestic Economy in Ireland. Some of these are residential and others are for day classes.

The particular object of the Department in promoting this type of instruction in rural districts of Ireland is to inculcate respect and affection for the home and the countryside, and thereby counteract the tendency to look down upon farm work and abandon rural life. The training aims at the making of efficient housewives. It does not aim at the preparation of girls for domestic service, or for the factory or the shop.

THE SCHOOL AT LOUGHGLYNN.

The School of Rural Domestic Economy at Loughglynn, Co. Roscommon, was visited by the Commission. The School is located about six miles from Castlerea. When the land was divided into small holdings under the Land Purchase Act, the manor house and small farm surrounding it became the property of an order of Nuns, the Franciscan Missionaries of Mary. The school was established in order to provide the women and girls of the neighbourhood with such practical training as would enable them to increase the comfort of their homes and improve generally the conditions under which they live.

The school takes pupils of about 14 or 15 years of age from the homes of the surrounding farmers. Day pupils only are received. They come between 9 and 9.30 in the morning. In winter they continue until 4 o'clock in the afternoon; in summer until 6. All come from within six miles of the school. The pupils receive practical instruction in Cooking, Sewing, the Care of Milk and the Making of Butter and Cheese, and in Poultry-keeping and Gardening. They also have an opportunity of acquiring some knowledge of Embroidery and Weaving. They are taught the small home industries such as mat-making. While the object of the school is to teach the daughters of farmers to be good housekeepers, we learned that as a matter of fact many of the girls went to situations, and many had gone to America.

As an accessory the school owns 25 outfits for spraying potatoes, and rents them to farmers in the vicinity at a shilling per day. Teachers of the school give the farmers instruction in how to prepare the mixtures and use the spraying outfit.

The Commission was impressed most favourably by the trim and worklike appearance of the pupils, and the evident effect upon them of spending one or two years in attendance at such a school. There were altogether 60 pupils in attendance.

The nuns, who are also the teachers of the school, visit the homes of the girls, and it is said to be a matter of common knowledge that the school has had a marked influence upon the improvement of the homes in the vicinity.

CHAPTER XXIII: THE CO-OPERATIVE MOVEMENT.

The co-operative movement in Ireland preceded the establishment of the Department of Agriculture and Technical Instruction. Its development has been concurrent with the extension of the work of the Department. The progress in the spirit, the principles and the methods of co-operation in rural communities owes nearly everything to the work of the Irish Agricultural Organization Society. Consequently it has been thought expedient to include a brief statement regarding the work of that Society.

Somewhat cognate with that has been the consideration of the question of Agricultural Credit. The Report of the Recess Committee (1896) contains a concise statement of the origin and work of the Raffeyen Banks. The Report of the Department of 1909-10 presents the present view of the Department concerning Agricultural Credit. In view of the suggestiveness of the work in Ireland in connection with these matters, brief statements are here presented concerning the three, viz.—Irish Agricultural Organization Society, the Raffeyen Banks, and Agricultural Credit.

SECTION 1: AGRICULTURAL ORGANIZATION.*

WHY IT WAS NECESSARY IN IRELAND.

There is a great magic in property, and within the limits of a farmer's knowledge, ownership of his land does set his thought on better farming of that land. But the Irish farmer was suffering from economic troubles of another kind which he could not diagnose. Prices of produce were falling, and he did not know why, and it became obvious to some observers that even if the Irish farmer paid no rent at all he would still remain miserably poor. The foreign farmer sold in Irish markets and flourished on the prices he received. Both had the same markets. One set of producers grew prosperous; the other set, nearer to those markets, could not make farming pay. It was not merely a question of rent, because the foreign farmer often paid as much rent as Irish farmers did. It was a question of business organization. The modern world had turned away from the old methods of doing business.

Wholesale provision dealers wanted to buy in a wholesale way as well as sell in a wholesale way. They could not be bothered with the few pounds of butter made by the small farmer or with his wife's weekly dozen or so of eggs. The expense of collection was too great. They wanted to buy butter and eggs by the ton, and they wanted to deal with agricultural producers who could supply them with large quantities of farm produce graded in the way they wanted,

*Material largely drawn from "The Work of the I. A. O. S." by Harold Barbour.

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always uniform in quality, so that they in their turn could sell it with the same confidence as a first-rate manufacturer of watches can advertise his timekeepers as always being true to the minute. The foreign farmer met the wholesale provision merchant. The foreign farmer had organized his business. In association with other farmers he bought, manufactured, and sold. He studied the markets, met their requirements, and got the trade. The Irish farmer knew nothing about this business organization of his rivals, and his business was going from bad to worse.

THE ORIGIN OF THE I.A.O.S.

"The foreign farmer had recognised that combination was just as necessary in farming as in any other business. He did not form companies. Under the company system capital came into conflict with the producers, and capital invariably predominated. Capital was not out for the sake of its health, but to make more capital, and this did not suit the farmers, whose business was exploited. It became gradually recognised over Europe that the co-operative system was the right one for farmers to adopt when combining for business purposes. It was found, too, that these co-operative combinations brought living and lasting bonds between the individual and his associates. Thus in a society the example of the most progressive member rapidly became the practice of the whole society, and any advice or instruction the State offered was more easily assimilated and put into practice by the association than it was by unorganised farmers with no bond of union. It was found where farmers combined they became very progressive, and where they did not combine they were backward and ignorant. It is easy to spread knowledge when pupils gather in a school. It is difficult or impossible to teach where there is no grading of pupils and the children remain at home. The co-operative associations placed the most progressive farmers at their head, and the whole district soon found themselves committed to swift progress and development.

SIR HORACE PLUNKETT'S WORK.

"The first person to apply these ideas in Ireland was Sir Horace Plunkett. He returned in 1889 to Ireland from America, where the advantage of combination in business has been perhaps unduly pressed and where little businesses are swallowed up until the Trust is all in all. But the advantages of combination were undeniable, and he himself started a crusade in the country and worked for some years with only one or two associates preaching the gospel of agricultural co-operation in the face of much opposition and chilling apathy. But the doctrine which is economically sound finally makes way. Slowly, very slowly, the first societies started like bathers unwilling to take a plunge into icy water; but those who did adventure found it paid, and then the demands from the country became so numerous that in 1894 the Irish Agricultural Organisation Society was formed as a necessary central body, first to establish co-operative societies among the farmers and then when established

to advise and guide them. The establishment of a central body was absolutely necessary. Just as the duties of parents do not end when they have brought children into the world and they are compelled to bring them up to manhood and womanhood, so it was not sufficient to establish societies and leave them. There was an immense amount of organising to do to bring the movement up to the point of efficiency of continental societies, and the I.A.O.S. had to undertake this work. Since its formation the I.A.O.S. has had a chequered career. At first it was mainly supported by Sir Horace Plunkett's friends, and very real friends to Ireland they were. Later it was the recipient of an annual grant from the Department of Agriculture which also owed its existence to Sir Horace. Now the organising body is dependent altogether on subscriptions and affiliation fees from the societies it has formed and on the subscriptions which still come from those who welcome a non-political and very practical way of doing something to bring peace and prosperity to the country. On its work the I.A.O.S. has spent over £100,000, and never was money better spent in Ireland. In the co-operative creameries alone it is admitted that the additional annual *gain* to the farmers through this organisation is now £400,000 a year. Regarded as a national investment this one result alone more than justifies the expenditure of the I.A.O.S. The total trade of the movement since it began is over £20,000,000. The annual turnover of the societies is considerably over £2,500,000, and it increases year by year. We believe few people will differ from us when we say that this £100,000 spread over 20 years was well-spent money.

AGRICULTURAL BANKS.

"Profitable farming, like any other business, necessitates the use of credit at certain times and seasons. The Agricultural Bank is the form of combination which has proved to be the most helpful way of dealing with farmers' credit. Previous to the introduction of these banks the farmers used to run a credit with his local trader, a system which was bad for the farmer, because he lost his independence and sometimes his farm. The I.A.O.S. has organised about 300 agricultural banks. These are associations of farmers who pledge their joint credit for the safe-keeping of any money lent to them or deposited. On this joint guarantee they borrow a large sum of money sufficient for the needs of their members at a low rate of interest and lend it out again to these members at a slightly increased rate. Hitherto it has been found possible to borrow money at from 3% to 4% and to lend it out at the popular rate of one penny per pound per month (less than 5%). From his agricultural bank the farmer can borrow in accordance with his needs. Money is only lent for reproductive purposes sanctioned by the Committee of the Society. Interest is not deducted beforehand from the loan, and the length of time for which the money is advanced is determined by the purpose of the loan. So is the method of repayment. A man borrowing money to buy a milch cow will be getting his cheque every month from the creamery, and so he can repay by instalments. Another farmer buying young pigs or fertilisers will have to wait six months, maybe, before his beasts are ready or his crops are sold, and he will repay in one sum when he has made

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his profit out of his loan. The peculiar needs of farmers are met in every way. The societies serve a very useful purpose in country districts, taking from the wealthy their superfluous capital, for which they pay a fair interest, and lending it out again to those who require it for reproductive purposes. The money of the district is in this way kept in the district, where it is always producing more money and doing good. The farmers also are instructed in the true use of credit, which is to borrow money to make more money and not merely to fill up some gap by throwing good money after money that is gone. This system, introduced into Ireland by the I.A.O.S., is the system of credit for farmers which is most widely used over Europe."

SECTION 2: RAFFEISEN BANKS.*

Raffaisen banks were introduced in 1886, when two were established, having collectively 54 members, in the Duchy of Austria, and in the following year the local Diet voted £300 to aid in this purpose. So rapid has been their growth that the Duchy now counts 396 of these banks. Moravia instituted one in 1887, and has at present 85. Among the mountaineers of Tyrol this form of banking has met with, relatively, the most complete development, no fewer than 122 of these institutions having been established between 1889 and 1894. The official returns show that in 1895 there were 994 Raffaisen banks in the empire; but the complete balance-sheets come no later than December, 1893, showing as follows:—

Year.	Banks.	Members.	Assets £ stg.
1886	2	54	360
1890	182	9,670	132,000
1893	565	35,470	410,000

At present it is estimated that the existing banks have 60,000 members, and assets exceeding £700,000 sterling. The programme and statutes differ very slightly in the various provinces, the object being to lend small sums to farmers at longer dates and lower interest than is usual with banks.

A dozen neighbors can start a bank, with a paid-up capital of £20 or more; each member takes one or more shares, and pays 2s. a-month per share until the whole capital is made up. The shares are usually £1 each; but in some few cases £2. None but neighbours can be shareholders, and nobody can hold more than 25 shares; the voting power is alike for all—one man one vote. No person who has been bankrupt or convicted of a felony, or who is interested in any other bank, can be a shareholder. Persons who wish to become shareholders must apply to the board of managers, who will admit or reject candidates at pleasure. Women may be shareholders, but cannot be elected to the board of management. When anyone wishes to retire from the bank, the managers return him the exact amount of his capital: he cannot sell his shares to an outsider. The managers receive no salary, except the bookkeeper—usually the village schoolmaster—who gets £1 a month for his trouble. The board

*From the Report of the Recess Committee (1896).
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must meet once a month, at least, the village priest being often the chairman. Each shareholder is liable in the whole amount of his fortune for any debts of the bank, but the transactions are so small that this causes no uneasiness.

AVERAGE OF LIABILITIES.

In 1893 each bank had an average of 63 members, with liabilities amounting to £900, that is £14 each: the average gross profits were £19 per bank, from which had to be deducted £12 to the school-master for keeping the books, leaving a net profit of £7 sterling. The following table shows the proportionate amount of advances to farmers, and the terms for which loans were made:

Amount.	Ratio.	Terms.	Ratio.
Under £8	23	Under 6 months	32
£8 to £32	49	6 to 12 months	28
Over £32	28	Over 12 months	40
<hr/>		<hr/>	
100		100	

The average amount of a loan is £13, the maximum fixed by law £128. The average term is 14 months, and no loan can be for longer than 4 years. Raffeisen banks are found chiefly in villages where the population may be between 600 and 2,000 souls. They receive deposits at rates varying with locality from $3\frac{1}{2}$ to $4\frac{1}{2}$ per cent., and charge interest on advances between $4\frac{1}{2}$ and 5 per cent.; the object being to make no profits, but to give depositors as high interest as possible while lending to borrowers at a minimum rate. The returns of 672 banks in 1894 showed as follows:—

Province.	Banks.	Deposits, £.	Loans, £.
Austria	396	355,000	250,000
Tyrol	122	140,000	85,000
Moravia	85	102,000	96,000
Bohemia	69	20,000	16,000
<hr/>			
4 Provinces	672	617,000	447,000

The Austrian Government makes a reduction of stamp-duty on all transactions of these banks, and in order to multiply them all over the Empire the several Diets vote annual subsidies to provide iron safes, books, etc., besides employing Wander-Lehrers to go about among the farmers and preach to them the adoption of every form of co-operation, especially Raffeisen banks. In this way the movement has progressed so rapidly that in the last two years no fewer than 430 new banks were established. It is admitted on all hands that they prove an incalculable blessing to the farmers, that they are worked almost free of expense, and that in all cases where the parish priest and school-master lend their aid (for a purpose so strongly recommended by the Catholic Congress of 1890) these banks are established without the least difficulty.

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SECTION 3: AGRICULTURAL CREDIT IN IRELAND.

The Department for some time have had under consideration the question of agricultural credit available for the rural classes in Ireland with a view to seeing what improvements should be made in the existing system, having special regard to the form of agricultural credit most suitable to the requirements of the occupiers of land affected by the Land Acts in the western districts and throughout the country generally.

The first part of the problem is concerned with the case of existing agricultural credit societies formed on the Raffeisen principle. There are at present in Ireland about 260 of these societies, most of which have been organised by the Irish Agricultural Organisation Society. In the year 1901 the Department, with the concurrence of the Agricultural Board, decided to assist societies of this kind by granting loans in suitable cases. At present there are about 100 credit societies holding loans from the Department, and the amount of the outstanding loans is about £9,000. Experience has shown that while many of the societies are doing excellent work, in some cases the money advanced by the Department is not being used to the best advantage, and it is evident that the societies would derive much benefit from a regular system of inspection and audit. The Department, believing that co-operative credit societies when established on a proper basis and when subject to adequate supervision and control can fulfil a most useful function in connection with the work of agricultural development, desires to see an improvement in the present methods of organisation and management.

The other aspect of the problem of credit has reference to the new tenancies which are being created under the recent Land Acts, especially in the West. Large areas of grazing land are being purchased by the State and are being subdivided into suitable farms which are being allotted to men brought from uneconomic holdings. As a rule the new-comers have little, if any, capital and are sadly deficient in farming knowledge. The Department has provided teachers and overseers, whose business it is to help the new occupiers and to give them instruction and advice necessary to work their farms with some success. But no general system has yet been devised whereby these men can obtain sufficient capital on favourable terms to enable them to stock and equip their farms. The case of these men is not met by the existing agricultural credit societies, as the amounts of the loans needed are on a larger scale than the transactions of such societies. The Department feels that the problem, which is one of great complexity, should be dealt with in the first instance by means of a systematic and comprehensive inquiry, and they have under consideration the question of entrusting such an inquiry to a small departmental committee.

CHAPTER XXIV: THE TECHNICAL INSTRUCTION BRANCH OF THE DEPARTMENT.

INTRODUCTORY.

The term "Technical Instruction Branch of the Department" is used here to indicate the portions of the Department's work which are directly concerned with education for and in Industrial, Urban Housekeeping, Technological and Art occupations.

This Branch of the Department is concerned with operations in the following fields:—

- 1, 2. Secondary Schools (the supplementary training of teachers, Scholarships and Grants.)
3. Technical Classes in various urban centres and rural districts.
4. Schemes under Local Authorities.
5. Central Institutions and Scholarships.

The funds which maintain the work of this Branch of the Department have been dealt with under Section 2 of Chapter XXI on "Administration and Funds," and in the information furnished by the "Conversation" with Mr. George Fletcher.

When the Department was inaugurated, it found itself confronted by conditions in the Primary (National) and Day Secondary Schools which did not provide the knowledge, training or experience necessary to enable pupils to derive the greatest amount of benefit from any scheme of industrial training or technical education. The situation which faced the Department called for the thorough teaching of Experimental Science, Drawing, Manual Instruction and Domestic Economy, to prepare boys and girls for Technical Instruction.

SECTION 1: THE TRAINING OF TEACHERS.

TEACHERS OF DAY SECONDARY SCHOOLS.

Technical Schools, or Science and Art Schools, provide special classes or courses for the instruction of teachers of Primary or Secondary Schools. In accordance with a scheme approved by the Department, grants may be paid for such service. The instructors must be recognized by the Department as qualified for this special work. In the report of 1909-10 it is said, "It is not proposed in future to demand the same high qualifications from teachers in the smaller schools as from teachers in the larger technical institutions, especially in the County Boroughs, nor to approve of the larger institutions employing teachers who from economic or other reasons have to be accepted as teachers in small schools."

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The training of teachers for Day Secondary Schools is provided for through courses of instruction to teachers held in July and August in experimental science (physics, chemistry, mechanical science, botany and physiology and hygiene), laboratory arts, drawing and modelling, domestic economy, manual instruction (woodwork), practical mathematics and mechanics, hand-railing, office routine and business methods, hygiene and sick nursing, housewifery, and rural science (including school gardening). A special course of instruction for teachers of crochet-work, embroidery and sprigging is also held.

The institutions at which the courses were conducted were:—The Royal College of Science, Dublin; The Metropolitan School of Art, Dublin; the Irish Training School of Domestic Economy, Co. Dublin; the Department's Industrial Annexe, Grand Canal Bank, Dublin; The Municipal Technical Institute, Belfast; the City of Dublin Technical Schools; The Christian Brothers' Schools, North Richmond Street, Dublin; the Municipal Technical School and School Garden, Kingstown; the Albert Agricultural College, Glasnevin; and the Crawford Municipal Technical Institute, Cork. Special centres were arranged for members of enclosed religious orders, for whom courses of instruction in experimental science, drawing and modelling and domestic economy were provided.

The courses were attended by 621 teacher-students, of whom 478 received certificates of satisfactory attendance and progress; the number attending for instruction in the various subjects being:—experimental science, 259; laboratory arts, 19; drawing and modelling, 117; domestic economy, 41; manual instruction (woodwork), 21; practical mathematics and mechanics, 29; hand-railing, 10; office routine and business methods, 19; hygiene and sick nursing, 19; housewifery, 19; rural science (including school gardening), 30; crochet-work, etc., 38.

TEACHERS OF NATIONAL SCHOOLS

In addition to the training provided for teachers in Day Secondary Schools, the Department has conducted classes for the training of National School teachers in Elementary Science at 10 centres. The number of teacher-students in attendance was 88, and the number who received certificates of satisfactory attendance and progress was 69.

Special Summer classes in Rural Science, including School Gardening, were held by the Department during the month of August. 30 National School teachers were admitted to these courses, and 25 received certificates of satisfactory attendance and progress.

There was a great increase in the number of classes conducted for the training of teachers in Domestic Economy. Classes were held at 18 Technical Schools. 422 teachers were presented for examination, of whom 367 secured certificates of satisfactory attendance and progress.

Special Drawing classes for National School teachers were conducted in 3 Technical Schools. These were attended by 23 teacher-students, but only 7 were presented for examination, and only one qualified for the certificate of satisfactory attendance and progress.

INSTRUCTRESSES OF DOMESTIC ECONOMY.

The Technical Instruction Branch of the Department carries on the work of training Instructresses for Domestic Economy classes for towns and cities at places separate from those under the Branch of Agricultural Instruction.

The work of the Irish Training School of Domestic Economy is carried on at St. Kevin's Park, Kilmacud, near Dublin. The Commission visited the School, which is housed in premises standing in grounds of about 3 acres. It can take in about 45 pupils, and about 15 qualified instructresses are turned out yearly.

The work of the School comprises two courses of instruction:—

(1) A course of one year in Household Management, the object being to train girls for the management of their own homes, and also to fit those who may not be selected for further training as teachers to undertake positions as matrons of large institutions, manageresses of hotels, etc.

(2) A two years' course of training for teachers of Domestic Economy.

All students of the School are required to attend the first-named course. Students are admitted to this course in August of each year. Applicants must satisfy the Department as to their general education. University graduates and applicants who have passed the Senior Grade examinations of the Intermediate Education Board, and who are otherwise suitable, will be admitted forthwith if accommodation is available. All others are required to pass an entrance examination, vacancies being offered to those who stand highest at entrance examination.

Only students who have worked satisfactorily through the course in Household Management are eligible for admission to the course of training for teachers of Domestic Economy.

At the close of each school year the Department, on consideration of the results of the examination held at the close of the course of Household Management, and the reports of their Inspectors and of the Teaching Staff upon the work of the students during the session, will select for training as teachers of Domestic Economy a limited number of students who have shown themselves most capable of taking full advantage of the course of training provided.

Students with physical defects of voice, sight, or hearing will not be selected to undergo the course of training.

The course of training, which extends over at least two complete sessions, involves a complete course of Domestic Economy suitable for teachers of this subject. It includes the principles of practical elementary science involved in domestic work; Cookery; Laundry; Dressmaking and Home Sewing; and Housewifery (including household routine and the keeping of accounts); and practice in the teaching of these subjects. Practical instruction in Home Hygiene and Sick Nursing is afforded, and instruction is given in the Theory and Practice of Education.

All students pay a fee of £10 per term (about 20 weeks), which includes tuition, residence and board, but not personal laundry, facilities for which, however, are afforded to students.

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SCHOLARSHIPS.

Scholarships at Residential Schools of Domestic Training of the value of £15 each, are awarded to a limited number of girls to enable them to attend for one year a regular course of instruction and training in Domestic Economy, such as will cultivate their intelligence and resourcefulness and render them more practical in the performance of home duties. The Scholarship, together with the payment of a fee of £2 on the part of the scholar, entitles the holder to board, residence, and instruction during the term of the Scholarship. (Under the County Cork scheme the value of the Scholarship is only £10, the scholar being required to pay a fee of £8.)

The total number of Scholarships for girls in 1910 by 10 different Committees was 63; the scholars were distributed among 7 approved Residential Schools of Domestic Training.

SECTION 2: SCHOLARSHIPS AND GRANTS FOR SCHOOL PUPILS.

Until 1910 Scholarships tenable in Secondary Schools were provided in connection with schemes under local authorities to encourage and enable students to take further courses of instruction than they would otherwise have been able or disposed to do. The Department had for a long time been aware that the object of these Scholarships, which was to prepare boys for industrial careers, had not been attained. The subject was brought up for discussion at the Board of Technical Instruction, and a Committee appointed to draft a revised scheme. The scheme has now been issued and will replace that previously existing.

The Scholarships are now divided into two classes:—

(1.) *Technical Scholarships* for boys of 13 years and upwards, who have completed their primary school course, tenable at Day Trades Preparatory Schools or other schools which provide a course of the same type.

(2.) *Apprenticeship Scholarships* for boys, who have attained the age of 16, tenable throughout the term of indentured apprenticeship to approved trades.

The intention of these Scholarships is to secure picked boys from the primary school and, after a period spent in a school offering a course specially designed to prepare him for a trade, to provide a sum sufficient to maintain the boy throughout the whole period of his apprenticeship in a skilled trade. It is believed that this scheme will remedy the defect so often experienced where a boy who has received a good preliminary training is unable to follow it up by apprenticeship in a skilled trade for which his abilities fit him.

GRANTS TO DAY SECONDARY SCHOOLS.

Grants are paid from the Parliamentary Vote, as outlined in the section on Administration and Funds, for instruction given at Day Secondary

Schools in Experimental Science, Drawing, Manual Instruction and Domestic Economy. Regulations for the administration and distribution of these grants are as follows:—

I. SUBJECTS.

1. *Experimental Science* shall mean such a system of instruction in Physical and Natural Science as will involve the greater part of the work being done by the pupils themselves in an approved laboratory.

2. *Drawing* shall mean a system of instruction in Freehand, Object, Model, and Geometrical Drawing, and Modelling.

3. *Manual Instruction* shall include instruction in the use of tools employed in Wood or Metal-working, and Drawing in connection therewith.

4. *Domestic Economy* shall include Cookery and Home-sewing, and may include Laundry-work or any other form of practical instruction in household management of which the Department may approve.

5. No scheme will be approved unless the Department is satisfied that due provision is made for the instruction of pupils in the other main branches of a general education.

II. GRANTS.

Grants in respect of courses of instruction in Experimental Science, Drawing, Manual Instruction, and Domestic Economy may be made, in accordance with the following regulations, to Day Secondary Schools in which sufficient provision is made for instruction in the other main branches of a general education:—

1. Grants shall be payable in respect of attendances made by those students only who are 12 years of age on or before the 31st day of May in the calendar year in which the course is entered upon, and who have completed an education which would entitle them to be placed in the Sixth Class of a school under the Board of National Education in Ireland. Pupils on the roll of a National School are not eligible for attendance grants.

2. Grants shall be payable in respect of attendances made by the pupils of those schools only which have been approved by the Department.

3. Grants on the average attendance of duly qualified pupils will be made for each hour of instruction per week throughout the school year, according to the following scale:—

Experimental Science.—10s. for the first year of the course; 12s. 6d. for second; 15s. for third; 20s. for fourth year.

Domestic Economy (as a Special Course).—8s. for third or fourth year of course.

Drawing.—5s. for the first year of the course; 6s. for second; 7s. for third or fourth.

Manual Instruction and Domestic Economy (Auxiliary Courses).—6s. for first year of course; 7s. for second; 8s. for third or fourth.

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III. COURSES OF INSTRUCTION.

I. The Courses of Instruction include:—

(a.) *A Preliminary (two year) Course* which is obligatory on all pupils and on all schools claiming grants under these regulations, and

(b.) *Special Courses*, which are optional.

The *Preliminary Course* may vary according to the character of the school, but it shall include Experimental Science for not less than 3 hours per week and Drawing not less than one hour per week. In schools claiming grants for more than six hours' instruction in this Course in any week, Manual Instruction or Domestic Economy must form part, and at least $1\frac{1}{2}$ hours' instruction per week must be devoted to one of those subjects.

In Schools also which do not provide instruction in one of the Special Courses, or whose Special Course has not been recognized by the Department for attendance grants, Manual Instruction or Domestic Economy, with Experimental Science and Drawing, shall constitute the Preliminary Course; and in order that the Preliminary Course in such schools may be recognized, the time-table must show that at least 6 hours' instruction per week is devoted to those three subjects.

A *Special Course* must include one, but may not include more than three subjects, to which Manual Instruction or Domestic Economy (unless taken as a Special Course) may be added. Managers will be allowed much latitude in selecting the subject or subjects most suitable to their own school.

Managers desiring to have the special courses of their schools recognized must show that a fair proportion of the pupils who have worked through the Preliminary Course are prepared to attend the Special Course; that not less than 3 hours per week are to be devoted to each subject of the Special Course; and that at least one-third of the time is to be assigned to theoretical instruction.

IV. LABORATORIES.

No grant will be made for instruction unless due provision is made for experimental work in Science, on the part of the pupils, in properly equipped and approved laboratories.

V. DURATION OF LESSONS.

Practical instruction in Science, Manual Instruction and Domestic Economy, must be given in lessons of at least 80 minutes' duration.

Lessons of less than 40 minutes' duration will not be considered in computing the "total number of hours of attendance."

The minimum time per week recognized for grants on behalf of attendance at Manual Instruction or Domestic Economy is $1\frac{1}{2}$ hrs.

The time-table must be so arranged as to leave sufficient time to the teacher for preparation of laboratory work.

VI. SIZE OF CLASSES.

Not more than 40 pupils shall be taken at a time by one teacher for Theoretical Instruction, nor more than 20 for Practical Instruction in any subject, unless an assistant recognized by the Department is provided. In that case the number for Practical Instruction may be increased to 30. Instruction in Drawing may, for this purpose, be regarded as theoretical instruction.

Where classes for practical instruction are small, concurrent instruction in two subjects may be exceptionally allowed, but the approval of the Department must be obtained in each case.

EXTENT OF THE WORK IN 1909-10.

Information on the principles which guide the policy of this Branch in carrying out this work are referred to at some length in the "Conversation" with Mr. George Fletcher.

The total number of primary Schools for which grants were paid, through the Department, for Drawing and Manual Instruction was 95 Schools. The amount of the grants was £1,639.

The total number of Day Secondary Schools for which grants were paid, through the Department, for courses given in Experimental Science, Drawing, Manual Instruction, Domestic Economy was 286 schools. The following table shows the number of pupils taking each of these courses in each of the four years, and the amount of the grant earned in connection therewith.

	1st year	2nd year.	3rd year.	4th year.	Total. Grants.
Experimental Science...	6,127	4,397	2,072	352	£21,247
Drawing.....	6,127	4,397	453	66	3,999
Manual Instruction...	1,437	684	116	5	1,121
Domestic Economy....	453	206	389	48	1,100
					£27,467

13,406 individual students participated in the work.

SECTION 3: TECHNICAL SCHOOLS AND SCIENCE AND ART SCHOOLS AND CLASSES.

The Technical Schools or Science and Art Schools, where educational work to the satisfaction of the Department is done, may draw special grants for pupils who take courses and classes at them, as outlined in the information from Mr. George Fletcher. During 1909-10 the authorities of 87 Technical Schools or Science and Art Schools and Classes received grants through the Department from Parliamentary votes amounting to £18,223, the total number of students concerned being 8,102.

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Some extracts, which contain information appropriate and useful to Canada, are taken from the Regulations which are designed to provide supplementary aid towards the instruction given in these Technical Schools and Classes.

DIFFICULTIES AND ADVANTAGES OF EVENING CLASSES.

The Schools and Classes working under this Programme are mainly, though not exclusively, Evening Schools. It may be useful to indicate the position which teaching in evening classes occupies in relation to other branches of education. It is clear that instruction in evening classes cannot form a substitute for the more general systematic education given in Day Schools, whether Primary, Secondary or Technical. The work of such evening schools and classes constitutes a specialised form of education intended to fit those receiving it for industrial or commercial pursuits, or to render those already engaged in such pursuits more efficient in their work. Instruction of this nature in evening schools has obvious defects; it possesses, however, certain well marked advantages. Attendance at such schools is purely voluntary. Those attending are for the most part engaged or about to be engaged in some form of industry—they have commenced the serious work of life—and are meeting problems and difficulties which the Evening Technical School can help them to solve. They perceive that the higher branches of their calling may be reached only by increased technical skill and knowledge. This being the case, the attitude of evening students to instruction is usually most favourable; but progress is hindered by several circumstances: hitherto the previous preparation of students joining evening Technical Schools has in many cases not been such as to fit them for the specialised form of instruction which it is the special function of such schools to impart.

An attempt is made in these Regulations to remedy this defect. Before a student can take full advantage of a specialised course of instruction in any branch of Science or Technology he should at least be able to express himself clearly, both orally and by means of writing and drawing; he should be able to make such elementary calculations as are required in all industries, and he should know something at least, and that something really and practically, of the fundamental principles of science underlying all industrial work. Without this preparation a student cannot hope to profit by a specialised course. He will be continually handicapped and disheartened by the difficulties, and will tend to retard other members of the class who may be better prepared. When these conditions are not satisfied the young student should be given an opportunity to comply with them, and to this end should enter the Preparatory Course.

A second difficulty is the shortness of time available for instruction in Evening Classes. For students engaged in arduous work during the day the amount of time devoted to evening technical school work must be severely limited. Speaking generally, not more than two evening attendances a week can be expected, for homework is essential if full advantage is to be derived from the work in class. The hours of school study thus limited become precious, and the organisation of the School and the efforts of the teachers should be earnestly directed to the most thorough utilisation of these two hours, and to this end every lesson should be carefully prepared. It will, moreover, be obvious that, under such circumstances, regular attendance becomes a matter of the highest importance. The Department mark their sense of the importance of this by the "Increment Grant," under which largely increased grants are paid for continued attendance over 20 hours up to a limit of 120 hours.

Instead of offering a number of *Subjects* a school should offer a number of *Courses*, and no student should be allowed to omit subjects of fundamental importance. Where, however, a student on entering a school shows a competent knowledge of the earlier stages of a Course of Study he may be allowed to join the Second or Third Year Course.

SOME OF THE REGULATIONS FOR GRANTS.

For the purposes of grants the subjects which may be included in specialised courses of study, and on which payment may be made, are grouped as follows, but courses of study may be taken from different groups.

Group A.—Commercial Subjects (Section A.)

Group B.—(1) Commercial Subjects (Section B.)

(2) Languages.

(3) Mathematics.

Group C.—Science (Pure and Applied).

Group D.—(1) Handicraft.

(2) Domestic Science.

Group E.—Art Subjects.

Group C.—*Science (Pure and Applied).*

Under pure science will be included such subjects as mechanics, physics, chemistry, biology, botany, zoology, physiology. Under applied science would be included naval architecture, navigation, nautical astronomy, building construction, machine construction, and other subjects involving systematic instruction in the underlying scientific principles, and which would be classified under such headings as:—

- (1) Building industries.
- (2) Metal industries.
- (3) Textile industries.
- (4) Printing and process industries.
- (5) Furniture industries.
- (6) Leather industries.
- (7) Woodworking industries.
- (8) Carriage Building industries.
- (9) Electrical industries.
- (10) Chemical industries.
- (11) Agricultural industries.

At least half the instruction in subjects included in this group should be practical, and must be given under approved conditions of accommodation and equipment.

The practical work must be so arranged as to be illustrative of the principles taught, and should not be directed to developing dexterity in the practice of trade processes.

DAY SCHOOLS FOR APPRENTICES AND OTHERS ENGAGED IN BUSINESS.

Day technical or commercial schools or classes, which are conducted by properly constituted managers, either in conjunction with works, business houses, or technical schools, with a view to improving the conditions of local industries and commerce, and to the further training of sub-managers, foremen, tradesmen or apprentices, may be admitted for grants under this section.

Such schools or classes must be open on one or more days of the week, not later than six o'clock in the evening, or than 1 p.m. on Saturdays.

Grants not exceeding three-fourths of the certified annual expenditure for the conduct of such schools or classes may be made by the Department in respect of students for whom an employer's certificate can be produced, showing that the students have been engaged during session in a business, trade, or industry, or that they are indentured or properly engaged as apprentices to a firm or to an individual.

The expenditure must be set forth in properly audited accounts, to be accompanied by vouchers.

The decision of the Department as to what constitutes a legitimate charge against annual expenditure shall be final.

The accommodation provided, the courses of instruction, the syllabuses of the subjects taught, the qualifications of the teachers, the time-table of instruction and the estimate of expenditure, must be approved by the Department.

The practical work must be so arranged as to be illustrative of the principles taught, and should not be directed to developing dexterity in the practice of trade processes.

SCHOOLS OF ART.

Schools of Art, which provide for students, the majority of whom are *industrial*, courses extending continuously over two or three years, according to a scheme approved by the Department, may be paid grants not exceeding three-fourths of the actual expenditure incurred in the conduct of such courses.

The expenditure must be set forth in properly audited accounts, to be accompanied by vouchers. An estimate of the expenditure must be submitted for the approval of the Department before the commencement of the session.

The decision of the Department as to what constitutes a legitimate charge against annual expenditure shall be final.

No grants will be payable to Schools of Art adopting this section of the regulations, under the methods of payments set out in Section III.

Recognition may be withheld or withdrawn from any School of Art in which, in the opinion of the Department, the efficiency of the instruction and the number of students in attendance do not justify the expenditure involved.

The amounts of grants payable in respect of any school may, on account of conspicuous merit, be increased by one-tenth, or, upon grounds of inefficiency, be decreased by one or more tenths, as the Department, in consideration of their Inspector's report, may determine.

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SECTION 4: SCHEMES UNDER LOCAL AUTHORITIES.**INTRODUCTORY.**

The various schemes of technical education under Local Authorities throughout Ireland are, on the whole, doing excellent work. They are revised annually in accordance with the experience gained. Nearly all the Local Authorities are now spending the whole of their available income, and in many cases their operations are very materially restricted by want of means. In a number of Urban Centres the provision of permanent buildings has proved unavoidable, and loans have been raised for the purpose of providing new buildings, the repayment of which falls upon the annual income, already too small for the maintenance of the school. Under these circumstances there is little opportunity for extension even on lines which have been shown to yield excellent results.

A statement is presented of the general conditions under which these schemes are carried on. That is followed by a presentation in detail of a typical scheme for the County of Kilkenny. This was chosen because the chief industries of the county represent those of many counties in Canada. The statement in detail under the sub-heading of Finance is presented in order that local authorities might see in detail the proportion of the total cost met from various sources of local revenue and by the contributions from the Department. After that, the scheme of a comparatively small urban district—that of Portadown, with a population of 10,092—is given in detail. Under the sub-headings of Finance and Subjects of Instruction, information is presented in detail of value to local authorities in Canada.

Altogether there are 35 urban schemes, participated in by 19,196 individual students; 30 county schemes, with permanent centres of instruction attended by 7,177 students; 34 county schemes with itinerant instruction, in which the classes are attended by 16,536 individual pupils. The total number of pupils in connection with the schemes under local authorities is 42,909, made up of 16,784 young men and 26,125 young women. Of these, 2,948 are boys and 2,998 girls who are still attending school.

OCCUPATIONS OF YOUNG MEN.

The occupations of the young men attending these classes are as follows:—

Engaged in Farming Occupations	2,338
Building Trades	1,127
Coach and Car Builders	65
Engineers and Metal Workers	1,485
Architects, Surveyors and Civil Engineers	125
Electrical Engineers, Instrument Makers	259
Textile Industries	550
Painters and Plumbers, Gasfitters, etc.	378
Applied Art Trades—Jewelry, Furniture	164

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Chemists, Analysts, etc.	269
Salesmen, Shopkeepers, Clerks, etc.	3,621
Teachers	697
Students (University, etc.)	264
Other occupations	1,343
Boys just left school or college	296
Boys still at school or college	2,948
No occupation stated	612
Total	16,784

OCCUPATIONS OF YOUNG WOMEN.

The occupations of the young women are as follows:—

Farming Occupations	6,256
Domestic Service	1,526
Printing Trades	39
Dressmakers, Milliners, etc.	763
Textile Industries	410
Other factory workers	709
Embroidery, Lace, etc.	1,972
Saleswomen and Shopkeepers	1,300
Clerks	929
Teachers	2,117
Students (University, etc.)	131
Other occupations	1,613
Girls just left school or college	58
Girls still at school or college	2,998
No occupation stated	4,777
Total	26,125

The amount of money contributed by the Department from its Endowment Fund in 1909-10 was £58,916. £29,514 was contributed from local rates.

In addition the Schools and Classes earned grants, paid from Parliamentary Votes through the Department, amounting to £18,223 for the work of 8,102 pupils.

GENERAL CONDITIONS FOR EACH OF THE SCHEMES.

The Scheme is not intended to apply to children under 14, but such children who have been placed in the Sixth Class of a National School, or who have received an equivalent education, may be admitted to classes provided that there is accommodation available. Under no circumstances may scholars on the roll of a Primary School attend classes, under the Scheme, which meet during Primary School hours.

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Schools or classes conducted or aided under the provisions of the Scheme shall be at all times open to the Department's Inspectors, who from time to time report to the Department on the condition and suitability of the school buildings or class-rooms, the character of the instruction and its suitability to the needs of the locality, the sufficiency of the teaching staff for the number of students under instruction, the progress of the students—which they may ascertain in such a manner as may be necessary—the method of registration, and, generally, the observance of the provisions of the Scheme.

Classes conducted or aided under the Scheme shall not be of such a size as to impair the efficiency of the instruction. (A practical class should consist of not more than 20 students under one teacher, and a theoretical or demonstration class of not more than 40 students. Local Committees should assist teachers in keeping classes within these limits).

Control will be exercised over the admission to classes so that students may take only associated subjects, and admission to certain classes may be limited by entrance examinations in order that the classes may be of a manageable size, and that students selected may be capable of taking full advantage of the instruction.

Classes will, unless in exceptional circumstances, be closed should the average attendance for four successive lessons fall below six.

Attendance Registers shall be carefully, regularly, and punctually marked.

A Local Committee of Management shall be formed in each centre in the Rural Districts where classes are to be held. The Committee formed shall appoint an Honorary Secretary, and place itself in communication with the County Joint Committee. In an Urban District the classes shall be under the management of a Local Committee appointed for this purpose by the Urban District Council. Wherever the instruction of girls is involved a number of ladies should be included in the Local Committee.

The duties of a Local Committee are:—(a) to arrange for suitable accommodation for the courses of instruction to be given; to awaken local interest, and to make due provision for the starting, or resumption, of the course. (b) to assist in securing regular and punctual attendance at the classes; (c) to visit the classes from time to time, and to check and sign the registers, and (d) to make recommendations to the County Committee as to local requirements in connection with the classes.

(A) SPECIMEN TECHNICAL INSTRUCTION SCHEME, COUNTY KILKENNY.

The Scheme ran from 1st August, 1910, to 31st July, 1911. Subject to the provisions requiring local contributions from the rates, it was applicable to the Urban District of Kilkenny and to all the rural districts within the administrative area of the County Council.

Population of County:—Urban Dist., 10,609; Rural, 68,550; total 79,159.

Valuation of County:—Urban Dist., £19,552; Rural £344,369; total £363,921.

Valuation of 1d. rate:—Urban Dist., £81; Rural, £1,434; total £1,515.

The County Council's contribution from the rates was paid over to the Committee in quarterly instalments; the Urban District Council's contribution two-thirds in October, 1910, and balance in March, 1911.

The Technical Instruction Committee is a Joint Committee of the Kilkenny County Council and the Urban District Council of Kilkenny, consisting of 31 members, of whom 17 are councillors, and 14 added members.

CHIEF INDUSTRIES.

The most important industries (excluding agriculture and allied industries) are building trades, woollen cloth manufacture, engineering, cycle making, furniture making, tobacco curing, marble and slate quarrying and working, monumental carving, printing and book-binding, milling, foundry-work, brewing, cooperage, weaving, baking, cabinet-making, boot-making, coal-mining, distilling, tanning.

OBJECTS OF THE SCHEME.

The objects of the Scheme are to provide, mainly by classes in Evening Technical Schools and in the Day Trades Preparatory School, by scholarships, and by the employment of itinerant teachers, instruction in technological, science and art, commercial, industrial, and domestic economy subjects.

The Scheme is set out under the following heads:—(1) Finance. (2) Subjects of Instruction. (3) Teaching Staff. (4) Day Trades Preparatory School. (5) Itinerant Instruction. (6) Scholarships for Boys. (7) Evening Technical Classes.

(1.) FINANCE.

A. <i>Estimated Income.</i>	£
(1) Contribution from County Council from rates levied over the rural Districts, year ending 31st March, 1911.....	540
(2) Contribution from Urban District Council of Kilkenny (produce of rate of 1d. in the £ levied in financial year ending 31st March, 1911).....	80
(3) Contributions from Department:—	
(a) Annual Grant from Endowment.....	£ 820
(b) Special Grant towards maintenance of Day Trades Preparatory School.....	£420
(c) Grants for Instruction in Science, Art, etc.....	£150
(d) Grant in aid of the Scholarship Fund.....	£ 50
	1,440
(4) Students' Fees, and Sale of Books, Class Materials, etc....	60
(5) From Managers of Day Secondary Schools for part services of Art Master.....	80
	1,440
Total.....	£2,200

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B. Estimated Expenditure.

(1) Salaries of Teachers:—	£	
(a) Principal and Secretary.....	260	
(b) Permanent Teaching Staff.....	965	
(c) Increase of Salaries of Permanent Teachers	30	
(d) Temporary Teaching Staff.....	80	1,335
(2) Travelling expenses and Allowances.....		100
(3) Scholarships for Boys.....		188
(4) Prizes.....		60
(5) Maintenance of Classes at Temporary Centres, including rent of rooms, cost of supplies, removal of equipment, etc.		150
(6) Maintenance of Classes in Urban District of Kilkenny, including rent of premises, insurance, caretaker's wages, heating, lighting, etc.....		250
(7) Equipment.....		37
(8) Administration, including cost of clerical assistance, office expenses, printing, stationery, and advertising.....		80
Total.....		£2,200

SUBJECTS OF INSTRUCTION.

IN EVENING CLASSES.

Preparatory Course.—English, elementary mathematics, drawing, manual instruction (woodwork).

Commercial Subjects.—Shorthand.

Science (Pure and Applied).—Building construction and drawing, machine construction and drawing, physics, chemistry, tailors' cutting, carpentry and joinery.

Handicraft.—Manual instruction in wood and metal.

Domestic Science.—Cookery, housewifery, laundry-work, dressmaking, home-sewing, sick-nursing, hygiene.

Art Subjects.—Freehand, object, model, and blackboard drawing, drawing in light and shade, design, geometrical drawing, painting of ornament in monochrome.

AT TEMPORARY CENTRES.

The subjects taught will mainly be those mentioned in Sect. (5) —'Itinerant Instruction,' but such of the subjects above-mentioned as may be suitable to a particular locality may be added from time to time.

IN THE DAY TRADES PREPARATORY SCHOOL.

Experimental science and drawing, workshop mathematics, manual instruction in wood and metal, practical geometry, and literary subjects, including one modern language in addition to English.

(3) TEACHING STAFF.

The teaching staff will comprise permanent and temporary officers.

The *permanent* staff will consist of:—

(1.) A principal, whose duties shall be:—

To act as secretary to the Committee;

To give effect generally to the provisions of the approved scheme in accordance with instructions of Committee;

To supervise the work of the teaching staff;

To conduct day and evening classes as may be found necessary.

(2) A teacher of experimental science, mathematics, etc. with special qualifications in mechanical science.

(3) A teacher of art subjects, whose services will be partly utilised in conducting day classes in certain Secondary Schools.

(4) Two manual instructors.

(5) A teacher of English, mathematics and French.

(6) Three itinerant instructresses in domestic economy. The services of these instructresses shall be available in Kilkenny Urban District and other centres as may be arranged, (They will be entirely engaged in conducting courses of instruction in temporary centres between the close of one evening school session and the opening of the next.)

It will be a condition of all appointments on the permanent staff that teachers will be prepared to give instruction in rural centres, and in both day and evening classes, when required by the Committee, and that they shall be under control of the principal.

The *temporary* staff will consist of teachers specially qualified to give instruction in technical and commercial subjects, whose engagements shall be subject to such conditions as may be arranged at the time of making each appointment.

(4) DAY TRADES PREPARATORY SCHOOL.

The school is conducted at the City Technical School, Kilkenny. Its aim is to provide for boys over 13, who have received an education equivalent to that of the sixth standard of a National School, such a course of training as will fit them to enter upon an industrial career.

The course of instruction will extend over 3 years.

Candidates for admission will be tested by an entrance examination conducted under conditions approved of by the Department.

The Department will bear three-fourths of the approved net annual cost of maintaining the School. The proportion of the expenditure admitted for payment by the Department may be increased by one-tenth if the Department, after consideration of their inspectors' reports, are of opinion that the organization and teaching justify such a course, or may be reduced by one or more tenths if these are considered unsatisfactory.

A sum of £30, (included in the amount allocated for prizes) is reserved for pupils who have completed satisfactory courses at this School, and will be

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distributed as follows:—3 prizes of £10 each may be awarded to students who have most satisfactorily completed a course extending over 3 years, choice being made of the most deserving students, having regard to the report made by the Principal in each case. Should sufficient merit, in the opinion of the Committee, not be shown, any or all of the prizes may be withheld. The first moiety of the prize in each case shall be payable on the production of satisfactory evidence that the student has entered upon an apprenticeship, or taken up industrial employment approved by the Committee, and that satisfactory provision has been made for his receiving further instruction in evening classes. The second moiety shall be payable six months later, on the production of evidence of satisfactory progress on the part of the student.

(5) ITINERANT INSTRUCTION.

The subjects to be taught will include manual work in wood, technical drawing, building construction, cookery, laundry-work, needlework (including repairing, plain sewing and dressmaking), hygiene, housewifery. The teachers will continue to give short courses of instruction in centres where suitable arrangements can be made for accommodation of classes, which may be held for both day and evening students at each centre. Instruction will be adapted to local needs, and will be as practical in character as possible.

The short courses will be organized so as to allow a teacher to devote 30 days to instruction at each centre, and, when expedient, to work two centres concurrently.

In temporary centres a course of instruction in practical cookery and housewifery or manual instruction shall consist of 30 two-hour lessons, laundry-work 12, and needlework at least 18 such lessons. A time-table and itinerary showing distribution of time of itinerant teachers for the session is prepared as soon as possible after date fixed for return of forms of application.

(6) SCHOLARSHIPS FOR BOYS.

Provision is made for award of Scholarships to boys attending primary schools, the object being to aid promising boys, who have already received a satisfactory primary education, to receive at the Kilkenny Day Trades Preparatory School a course of instruction specially designed to fit them to enter upon an industrial career.

These Scholarships entitle the holders to free tuition and the free use of text books, tools, etc., at above School, and in a certain number of cases to a maintenance allowance, the amount of which will vary with the distance of the residence of the boy from said School.

(7) EVENING TECHNICAL CLASSES.

The Committee, in addition to maintaining the Kilkenny City Technical School, will establish, or aid in establishing, so far as the funds at their disposal permit, evening technical classes in places to be previously approved of by the

Committee and the Department,—(a) by acquiring or giving aid towards acquiring class rooms, (b) by making arrangements, so far as possible, to allow the Instructors employed by the Committee to conduct classes in subjects specially suited to the needs of the locality.

(B). SPECIMEN TECHNICAL INSTRUCTION SCHEME, URBAN DISTRICT OF PORTADOWN.

Chief Industries: Linen weaving, handkerchief weaving and hem-stitching, building, corn milling, engineering, fruit preserving, brick-making.

Population, 10,092. Valuation, £29,588. Value of 1d. rate, £123.

The local contribution from the rates was paid over to the Technical Instruction Committee in October, 1910, and February, 1911.

The Committee was appointed in February, 1908, and ceased to hold office in January, 1911. There were 15 members, of whom 8 were Urban District Councillors, and 7 added members.

The objects of the scheme, which ran from 1st August, 1910, to 31st July, 1911, were to provide: (1) Instruction by means of systematic courses in Science, Art, Technological, Commercial and Domestic Subjects, in Evening Classes, for those engaged in various industries during the day. (2) Instruction of a general scientific and technical nature for boys over 13 in the Day Trades Preparatory School. (3) Instruction for apprentices in the sciences and principles underlying their trades by means of a Day School for Apprentices.

The School is situated in Armagh Road and contains lecture rooms, art room, two class-rooms, manual instruction workshop, domestic subjects room, engineering workshop, physical and chemical laboratory (with balance and store rooms), mechanical laboratory, engine room, dark room, preparation room, scullery, offices, etc.

The Commercial Classes are held in the Free Library.

The Scheme is set out under the following heads:—

- (1) Finance.
- (2) Subjects of Instruction.
- (3) Day Trades Preparatory School.

(I) FINANCE.

A. *Estimated Income.*

(1) Contribution from Urban District Council (produce of a rate of 1d. in the £ levied in financial year ending 31st March, 1911).....	£	100
(2) Students' Fees.....		100
(3) Donations to Prize Fund.....		20

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(4) Contributions from Department:—

(a) From Endowment.....	£ 500	
(b) Grants for instruction in science, art, etc.....	300	
(c) Grant towards maintenance of Day Trades Preparatory School.....	405	£
		<hr/> 1,205
(5) Sale of books, cookery materials, etc.....		20
(6) Fees for instruction in experimental science of pupils from extern schools.....		12
(7) Grant from National Education Board for instruction in Cookery to National School children.....		8
		<hr/>
Total.....		£1,475
		<hr/>

B. *Estimated Expenditure.*

(1) Salary of Principal.....	275
(2) Salaries of other teachers.....	680
(3) Prizes and Scholarships (evening school only)	20
(4) Scholarships (Day Trades Preparatory School).....	22
(5) Caretaker's wages.....	52
(6) Fuel, light and cleaning.....	40
(7) Rent, rates and insurance.....	85
(8) Equipment (new and renewals).....	50
(9) Class materials.....	30
(10) Printing, advertising and stationery.....	40
(11) Repairs to premises, grounds, etc.....	5
(12) Administrative and incidental expenses.....	50
(13) Appropriation to meet the deficit on the working of the Scheme in previous Sessions.....	126
	<hr/>
Total.....	£1,475
	<hr/>

(3) SUBJECTS OF INSTRUCTION.

Preparatory Course.—English, mathematics, drawing, experimental science and manual training (woodwork).

Commercial Subjects.—Shorthand, typewriting, business methods and routine, book-keeping, commercial English, commercial correspondence, commercial arithmetic, commercial geography, banking and currency, economics of industry, and commercial law.

Languages.—French and German.

Mathematics.—Practical and pure mathematics, practical plane and solid geometry.

Science (Pure and Applied).—Carpentry and joinery, workshop practice, chemistry, experimental science, applied mechanics, machine construction

and drawing, magnetism and electricity, building construction and drawing, steam, mechanical engineering, electrical engineering, textiles, tailors' cutting, elementary science (teachers).

Handicraft.—Manual training (woodwork and metal work).

Domestic Science.—Cookery, laundry-work, housewifery, plain and fancy needlework, dressmaking, renovations.

Art Subjects.—Freehand, blackboard, geometrical and model drawing, drawing in light and shade, drawing of common objects, design, perspective,

(3) DAY TRADES PREPARATORY SCHOOL.

The Day Trades Preparatory School is conducted at the Technical School, Portadown, the aim being to provide for boys over 13, who have received an education equivalent to that of the Sixth Standard of a National School, such a course of training as will fit them to enter upon an industrial career.

The course of instruction extends over a period of 3 years, and includes experimental science, drawing, workshop mathematics, manual instruction, practical geometry, and literary subjects, including one modern language besides English.

The Department bears three-fourths of the approved net annual cost of maintaining the school. The proportion of the expenses admitted for payment by the Department may be increased by one-tenth if, in the opinion of the Department's Inspectors, the organization and teaching merit special recognition, or it may be reduced by one or more tenths if these, in the opinion of the Department's Inspectors, are unsatisfactory.

SECTION 5: CENTRAL INSTITUTIONS AND SCHOLARSHIPS.

As already mentioned under "Administration and Funds," Parliamentary Votes provide for the maintenance of the following Central Institutions:—

Royal College of Science.....	£16,097
National Museum of Science and Art.....	13,568
National Library of Ireland.....	5,477
Metropolitan School of Art.....	4,360
Royal Botanic Gardens.....	4,636

A special work carried on by the Department with these Institutions is the granting of Scholarships to enable approved persons to receive such education as will qualify them for posts under the Department or under local authorities in carrying out schemes which have been approved.

THE ROYAL COLLEGE OF SCIENCE.

This College at Dublin is an Institution for supplying an advanced Course of Instruction in Science as applied to Agriculture and the Industrial Arts; for

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training teachers for Technical Schools and for Secondary and Intermediate Schools in which Science is taught; and for carrying out scientific research.

FACULTIES.

The College embraces three Faculties:—

Agriculture.
Applied Chemistry.
Engineering.

The main function of the Agricultural Faculty of the Royal College of Science is the training of teachers for employment under the Department's programme of Agricultural Education. The course extends over 3 years. A number of valuable scholarships are offered annually by the Department in connection with this course. Almost all the students in the Agricultural Faculty are holders of scholarships. The total number of students in the Agricultural Faculty at the close of the Session in June, 1910, was:

First Year.....	14
Second Year.....	10
Third Year.....	8

8 students who completed their training in June, 1909, obtained the College diploma in Agriculture and received appointments during the year 1909-10 in connection with the Department's schemes of agricultural education. The total number of students who had entered the Agricultural Faculty as holders of scholarships provided by the Department, and completed the course by the end of the 1909-10 session was 64, of whom 31 are employed as Itinerant Instructors in Agriculture, 3 as teachers of Agricultural Classes, 8 at the Department's Colleges and Stations, and 11 at the Central staff of the Department.

The maintenance of this College is not a charge on the Endowment Fund of the Department. It is maintained out of other grants provided by the Treasury which are administered by the Department of Agriculture and Technical Instruction.

A very fine, large, commodious and well appointed building for the housing of the Royal College of Science was nearly completed when the Commission was in Dublin. The whole expense was borne from the Treasury at London.

In general the Institution is organized to be on a plane with the Faculties of Applied Science of first class universities, and with the Technical High Schools of Germany.

NATIONAL MUSEUM, DUBLIN.

The Department arranges for the loan, from the National Museum of Science and Art, of cases of objects to Agricultural and Technical Schools and classes or to other institutions. It is considered very desirable that learners should be able to obtain information from the examination of actual objects

as well as from books and lectures. Under the Circulation Branch cases are prepared and sent out from time to time as applied for.

One group of cases contains objects useful to illustrate *Industrial Crafts*. From many others the following are mentioned:—joints used in carpentry; door construction; roof trusses; cabinetmaker's work; wool, British and Colonial samples; wool, stages in manufacture; woollen goods made by machine knitting; paper manufacture; wallpaper printing; printing of books; bookbinding; varieties of leather; tanning of leather; manufactures from horn; manufactures from bone; filigree button making; manufacture of soap; bye-products of milk, etc.

There are also collections for the *Artistic Crafts*, including wood-carving, embroidery, hand-woven silks, copper repoussé work, engraving, carving stone, etc.

Cases may also be obtained with specimens illustrating plants, animals, metals and minerals. Cases are usually lent for periods of three weeks or seven weeks.

The collection of *Drawing, Design and Art* consists of works which have secured awards at the National Competition of Art Schools and Classes, works which have been accepted towards the Irish Secondary Teachers' Honours Drawing Certificate, and other school works of merit. The Department are prepared to send selected works on loan for a period not exceeding 14 days, to managers of Secondary and Technical Schools, in order to afford teachers and students an opportunity of judging the quality of execution to be aimed at in the work of Art Classes. As a rule, not more than 18 works will be sent in response to any one application.

The loan is made on condition that Managers make arrangements for the safe custody of the works, and undertake responsibility for any damage which may be done to them from the time of their receipt until re-delivery into the custody of the Department.

METROPOLITAN SCHOOL OF ART, DUBLIN.

The Department of Agriculture and Technical Instruction for Ireland offers, through this School, instruction to students in Drawing, Painting, Modelling, and Designing. In the evening classes workmen, apprentices and foremen can obtain instruction in the various branches of these subjects, as well as their application to craft work.

The School Session extends from the beginning of October to end of July. The School is open daily (Saturdays excepted) from 9.30 a.m. to 3.30 p.m. and from 6.30 to 9 p.m.

School lectures are regularly given in connection with most of the studies, and other lectures and demonstrations are given as the school work may demand. Students who intend becoming Designers, Art Teachers, etc., are expected to attend the classes in Principles of Ornament and Design and the lectures in connection therewith. Modelling students who are studying Design are also expected to attend them.

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COURSES.

There are two sections in the Art instruction, viz., Elementary and Advanced, the subjects including architecture, and mechanical drawing, landscape and artistic handicrafts. The subjects in detail are:—Linear drawing by the aid of instruments; freehand outline drawing on rigid forms from flat examples; freehand outline drawing from the "round"; shading from flat examples; shading from the "round" and solid forms; drawing the human figure and animal forms from flat examples; drawing the human figure, or animal forms from the "round" or nature; anatomical studies of the human figure or of animal forms; drawing flowers, foliage, landscape, details and objects of natural history, from nature; painting ornament from flat examples; painting ornament from the cast, etc.; painting from flat examples, flowers, still-life, etc.; painting direct from nature; painting from nature groups of still-life, flowers, etc., as compositions of colour; painting the human figure or animals in monochrome from casts; painting the human figure or animals in colour; modelling the human figure or animals; modelling fruits, flowers, foliage and objects of natural history from nature; time sketches in clay of the human figure or animals from nature; elementary design; drawings from actual measurements of structures, machines, etc., applied designs, technical or miscellaneous studies; work designed and executed in material wholly by the student.

ARTISTIC HANDICRAFTS.

The craft work taught at the school includes Enamelling and Art Metal work; Leather and Gesso work; Stained Glass work; while the teaching of other craft work is undertaken in connection with the Design Classes.

Numerous prizes are awarded in each section of the work of the school annually, providing that there is adequate competition and the standard of work in the various sections is sufficiently high.

DRAWING ON THE BLACKBOARD.

Practice in this exercise is specially directed to the acquirement, by students, of freedom and skill in using chalk, or brush with tempera, on the blackboard for the purpose of making drawings or diagrams in outline and in the mass on a large scale, and of illustrating various lessons to a class.

Students are urged to study many kinds of common objects, plants, and other examples, and cultivate a free and accurate style of Drawing. The representation of these subjects should show that their structure has been well studied, understood and expressed, all unimportant details being omitted.

In testing the student's ability to draw on the blackboard, the examiner calls upon the student (1) to make a drawing from memory of one or two objects, natural forms, ornamental forms, or subjects such as would be useful for illustrating a lesson to a class; (2) to sketch on a large scale an object or group of objects placed before him; and (3) to make an enlargement from a simple example, selected by the examiner for the purpose.

SCHOLARSHIPS.

FOR AGRICULTURE, HORTICULTURE, ETC.

A limited number of Scholarships are offered for competition among young men in Ireland who desire to acquire a thorough knowledge of Technical Agriculture, and one or more also for students who intend to specialize either in

Horticulture, Forestry or Creamery Management. Each Scholarship includes (1) free admission to the first year's course in the College, (2) railway fare to and from Dublin, and (3) either of the following, at the option of the Department (a) a maintenance allowance of one guinea per week while attending the Royal College or elsewhere as the Department may decide, or (b) free board and residence at one of the Department's institutions, in the latter case a small grant being made towards the cost of books and apparatus.

A Scholarship is tenable for one year, but selected candidates must undergo a probationary course of one term (about three months). If satisfactory progress be made by the holder, the Scholarship may be renewed for a second, third, and in certain circumstances even for the fourth year, to enable the student to complete his course.

The Department do not undertake to employ, or find employment for, students at the close of the period of training.

Holders must devote their whole time to the course of study prescribed for them by the Department. Candidates should be between 18 and 30 years of age; must have been born in Ireland or have been resident in Ireland for three years immediately prior to the 1st September; and must have had substantial experience of practical work in connection with farming, gardening, the management of woodlands, or dairying and creamery management. The examination may be written, oral and practical. The subjects will include all the ordinary work of farms, gardens, woods, or dairies, as practised in Ireland.

The holder's ability to impart instruction will be gauged by the style of answers in both written and oral examination.

FOR SCIENCE AND TECHNOLOGY.

A number of Scholarships and of Teacherships-in-training, tenable at the Royal College, are offered for competition among students of Science and Technology. Candidates must be not less than 16 nor more than 30 years of age. Holders of Royal Exhibitions or National Scholarships and present or past students of the Royal College of Science are ineligible as candidates. The Scholarships are of the value of £50 per annum and in addition entitle the holder to free instruction during the Associate Course, a maintenance allowance of 21s. per week for the session of about 40 weeks each year, and railway fare to and from Dublin.

Candidates awarded Teacherships-in-training undertake to pursue the full Associate Course with a view to becoming teachers of Science in Ireland and to refund sums paid to them as maintenance allowance and travelling expenses in the event of their leaving the college before obtaining the Diploma of Associateship.

The Associate Course extends over three years, the College session running from October 1st until June 30th each year.

Holders of Scholarships and Teacherships-in-training are required to devote their whole time to the work of the Associate Course, to comply with the regulations of the College, and to pass the examinations required for the Associateship. The continuance of the Scholarship or Teachership-in-training for a second or a

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third session will depend upon the ability and application which the student has shown during the previous session or sessions at the College.

In 1910, 55 candidates competed for the 5 Scholarships and 5 Teacherships-in-training offered for competition.

FOR THE SCHOOL OF ART.

The Department offers 3 Scholarships, tenable at the School of Art, for competition amongst students of Irish Schools of Art and Art Classes who propose to become Art Teachers in Ireland. The holders of all these Scholarships are entitled to free admission to all Day and Evening Classes at the School; a maintenance allowance of 21s. per week during the session (about forty weeks); and railway fare to and from Dublin. Scholarships may be renewed for a second session.

A limited number of Scholarships are offered for competition amongst apprentices, under the Goldsmiths' Corporation, who have attended the School regularly and punctually for at least one session. The Scholarships are of the value of £6 each, and entitle the holders also to free tuition at the School.

Admission free or at reduced fees is offered to students of the School who have paid fees for two consecutive sessions and who are preparing to become teachers, manufacturers' draughtsmen, designers, or Art workmen, providing they continue to make satisfactory progress in their studies.

CHAPTER XXV: THE MUNICIPAL TECHNICAL INSTITUTE, BELFAST.

INTRODUCTORY.

The Municipal Technical Institute at Belfast is such an excellent example of organization, plant and equipment to meet the industrial needs of the city, that a statement of its main features is presented. The authorities of any city considering the question of building and equipping such an Institute would do well to procure a copy of the latest prospectus, which can be obtained on application to the Principal at the cost of 8c. plus postage. It is a volume of 350 pages, with detailed information, and most suggestive. Only the barest outline of very important features can be given in the limited space of this Report.

The work of the Institute was begun in 1900, although the present building was not opened until 1906. In the interval, the Principal conducted such work as could be overtaken and, with the members of the Staff which had been gathered together and others, devoted much time to the plans for a suitable building with its equipment. One commendable feature is the grouping of the rooms for each department, with office rooms for the staff in the group, the group itself being placed as far as practicable in proper relation to the department with which it has most to do.

A Trade Preparatory School is conducted in the Institute for boys from 12 to 15 years of age. About 140 boys were taking the course. The Principal approved of the plan of having the Trade Preparatory School in the Institute rather than elsewhere in the city.

He also stated that there were advantages from having Day and Evening Classes in the same building, using the same equipment, provided the whole was under one management and practically one set of heads responsible for each department. The attendance at the Day Classes in the Technical School has not become large enough to satisfy the wishes of those responsible. The attendance at the Evening Classes was over 4,000 pupils. The population of the city was 349,000 in 1910.

The keeping of useful records of technical students, and the methods followed in the compilation of these to make them of the greatest service, have been a difficulty. That matter has been studied carefully by Mr. Forth, Principal of the Institute. An article by him on the method in educational institutions in regard to the compilation of technical students' records, was published in the *Journal of the Department of Agriculture and Technical Instruction for Ireland*, Vol. VI., No. 3.

The Queen's University of Belfast and the city Corporation have an agreement recognizing the Institute as a College in which students of the University may pursue a course, or part of a course of study qualifying for their degree

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of Bachelor of Science (B.Sc.), Master of Science (M.Sc.), Doctor of Science (D.Sc.), or a diploma.

The Departments in which courses, or parts of courses, are recognized, and in which courses of study already are or may be provided are those of Mechanical Engineering, Electrical Engineering, Chemical Technology, Textile Technology, Architecture and Naval Architecture.

SCOPE OF THE INSTITUTE.

The chief object of the Institute is to provide instruction in the principles of those arts and sciences which bear directly or indirectly upon trades and industries, and to show by experiment how these principles may be applied to their advancement.

All departments are open to both sexes. The evening classes are suitable for persons engaged during the day in handicrafts or business, who desire to supplement and develop the knowledge and experience they have gained in the workshop, warehouse, etc. Apprentices, journeymen and others employed in the various industries of the city and district cannot fail to profit by the facilities for self-improvement now so liberally placed within their reach.

Intending Science and Technical Students are reminded that the successful prosecution of their special studies will be in proportion to their knowledge, at the beginning, of the elements of Mathematics and Drawing,

Students are required to consult with the teacher of the class proposed to be joined, and to obtain the teacher's initials to the Entrance Form, before applying at the office for the ticket of admission to the Class.

The Classes are open at the fees named to students from any district in which the Technical Instruction Act is in operation, provided that the regulations as set out in the Time Table of Classes are complied with.

Non-naturalised foreigners are charged fees higher than those set out in the Time Table.

Laboratory and workshop classes are open only to students in regular attendance at the corresponding lecture courses.

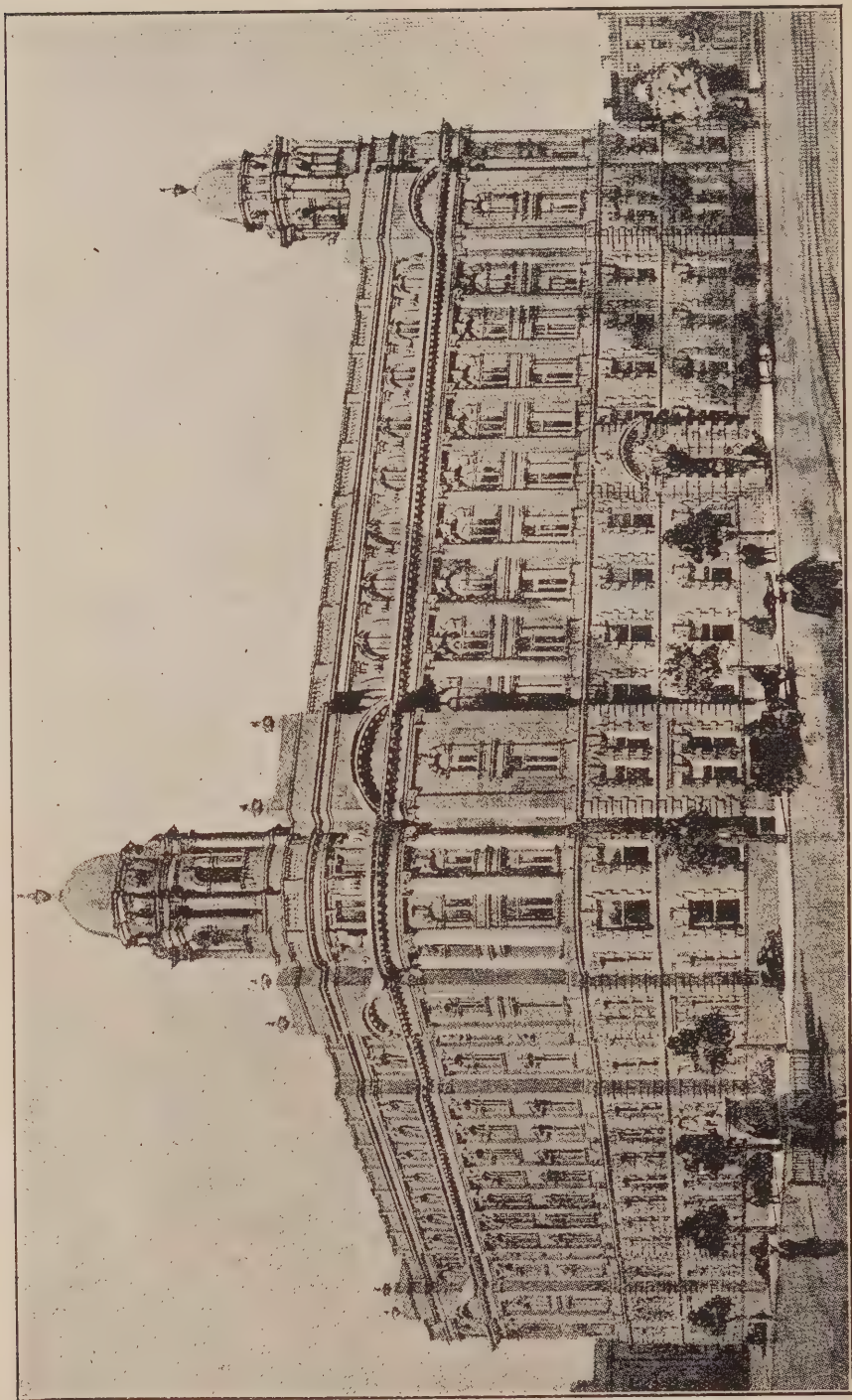
EQUIPMENT.

The Institute contains a full range of Classrooms, Lecture Rooms and Drawing Rooms, and is furnished with very completely equipped Laboratories for Mechanical Engineering, Physics, Electrical Engineering, Pure and Applied Chemistry, and with Workshops for Spinning and Weaving, Wood Carving, House Painting and Decoration, Typography, Lithography and Bookbinding, Baking, Cake Ornamentation, and other trade subjects.

There are practice rooms for Cookery, Laundry work, Dressmaking and Housewifery.

The Institute also contains a completely equipped School of Art.

A Gymnasium, fitted up with the most modern appliances for physical training, has been installed.



THE MUNICIPAL TECHNICAL INSTITUTE, BELFAST: PERSPECTIVE VIEW OF THE BUILDING.

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TRADE PREPARATORY SCHOOL: PHYSICAL LABORATORY.

TRADE PREPARATORY SCHOOL.

The Library and Technical Instruction Committee has established this School as a Junior Section of the Day Technical Division, the principal object of the School being to provide a specialised training for boys who are intended for industrial occupations. Whilst due regard is paid to the subjects of a general education, special attention is devoted to imparting a sound training in the elements of science, and in science as applied to local arts and manufactures, such as those which fall under the heads of Mechanical Engineering, Naval Architecture, the Building Trades and Textile Industries.

The complete course of instruction is designed to extend over three years.

With the object of making the school work as thorough as possible, the theoretical instruction imparted in the class-room is supplemented by practical work in the Laboratories, the Workshop and the Drawing School.

Boys who follow out this complete course will be in a position to enter upon their life work in the mill, factory or workshop with a sound preparatory training, and will have acquired that scientific habit of mind which will qualify them to take part in the development of the industries of the city, and later—when their school training has been reinforced by practical experience—to rise to positions of responsibility. Furthermore, youths leaving the School at the age of 16 or 17 to enter upon an industrial career will be fitted to continue their education in the higher classes of the Evening Division of the Institute, and to derive the maximum benefit from attendance at those classes.

Applicants for admission to the School must be *not less than* 12 years of age on the 31st May in the year of Examination, and must have been enrolled in the Sixth Standard of a National School for at least 12 months, or show that they have reached an equivalent educational standard. The entrance examination is held in June.

OUTLINES OF COURSES.

With a view of indicating the nature of the instruction given, the following outlines of the courses of instruction are supplied:—

First Year.—Mathematics, English, Drawing, Experimental Science, a Modern Language, Manual Training, Educational Gymnastics.

Second Year.—Mathematics, English, Physics, Chemistry, Practical Geometry, the Elements of Machine Drawing, Mechanics, a Modern Language, Art, Manual Training, Educational Gymnastics.

Third Year.—Mathematics, English, Physics, Mechanics, Mechanical Laboratory, Practical Plane and Solid Geometry, Machine Drawing, a Modern Language, Manual Training, Metalwork, Art, Educational Gymnastics.

FEES.—The fee to pupils who pass the Entrance Examination, but who are unsuccessful in obtaining Scholarships, is sixpence per week, payable weekly. Parents who wish to do so may pay a sum of £1 in advance to cover the year's instruction. Non-Scholarship pupils are required to provide themselves with books, instruments, etc., required (costing for first year's course about £1 5s.

The School is open from Monday to Friday, from 9.30 a.m. to 12.30 p.m., and 1.30 p.m. to 4.30 p.m. Punctual and regular attendance is considered

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a first essential, for without this no satisfactory progress can be made. Pupils are required to attend during the hours specified, and deviations are not permitted.

In case of unavoidable absence or unpunctuality, a written explanation, signed by a parent or guardian, should be sent to the Head Master. All pupils of the School are expected to wear the school cap.

The work of the pupils will be tested by Examinations of the Institute, and of the (London) Board of Education; but the instruction will not be directed towards preparing pupils for nor will pupils be entered at the Examinations of the (Irish) Intermediate Board of Education.

Parents or guardians are required to enter into an undertaking not to remove pupils from the School before the end of the School Year in July. But should they not desire to comply with this Regulation, exemption may be obtained by payment of five guineas (\$25.50) for the course of instruction.

DAY TECHNICAL COURSES.

The Courses have been established to provide a sound training in the science and technology of Mechanical and Electrical Engineering, the Textile Industries, and Pure and Applied Chemistry. The Courses give a suitable preparatory training to youths who aim at filling positions of responsibility as mechanical engineers, electrical engineers, spinners, manufacturers, manufacturing chemists, or in other industrial occupations.

Candidates must not be less than 15 years; must be prepared to pass an entrance examination and have a standard of education not lower than that of the Junior Grade of the Intermediate Board. A workshop training or other practical acquaintance with the branch to be studied is not required, but practical experience will be found a distinct help in following the programme of instruction.

Various opinions are held as to the best educational preparation for youths intended for engineering in its several branches. The instruction for the engineering departments has been planned with due regard to the recommendations contained in a special report on this subject.

The instruction is of University standard, and thoroughly practical. Students who have, previous to entering upon the Course, passed the Matriculation Examination of the London University, are prepared for, and should have no difficulty in taking, the degree of Bachelor of Science with Honours, in either Mechanical or Electrical Engineering.

The instruction does not consist merely of courses of lectures; the Institute is provided with well-equipped Laboratories and Drawing Offices specially arranged for extensive and thorough instruction in both the experimental and commercial aspects of the subjects taught. The teachers aim at keeping in touch with the industry to which the instruction is related, and visits to places of interest are arranged from time to time.

The programme of instruction extends over three years. In the First Year it is common to all the departments. In the Second Year it is specialised in certain subjects according to the department entered. In the Third Year it is almost wholly specialised.

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The Course of Instruction is of 30 hours' duration per week, and the Session continues for about 40 weeks. Students attend from Monday to Friday, from 9.30 a.m. to 12.30 p.m., and 1.30 to 4.30 p.m.

ALLOCATION OF TIME IN SECOND YEAR.

The allocation of hours for the Second Year Course indicates the programme of instruction in each of the four departments. The subjects are treated in a similar way but in a more advanced manner during the Third Year.

Subjects.	Mech'l Engineers.	Elect'l Engineers.	Textile Students.	Chemical Students.
Mathematics.....	5	5	5	5
Applied Physics.....		2		2
Geometry.....	2			
Mechanical Drawing.....	3	3	3	3
Mechanics.....	1		1	
Machine Shop Practice.....	3	3		
Theory of Machines.....	7			
Heat Engines.....				
Hydraulics.....				
Strength of Materials.....				
Electrical Engineering.....	2	6		
Electrical Machinery.....	2	6		
Textile—Raw Materials.....			1	
Spinning.....			3	
Weaving—Preparatory Processes.....			1	
Construction and Testing.....			2	
Design of Patterns.....			2	
Weaving.....			2	
Inorganic and Organic Chemistry.....				4
Practical Chemistry.....				8
Bleaching, Dyeing, and Finishing.....			1	3
Design.....			4	
English.....	2	2	2	2
German.....	2	2	2	2
Gymnastics.....	1	1	1	1
Total.....	30	30	30	30

OCCASIONAL STUDENTS.

With a view to meeting the requirements of a number of students who have applied for admission to the classes in the Day Department of the Institute, but who are not in a position (owing to business engagements and other reasons) to attend the Full Day Technical Course, it has been arranged to admit students to portions of the course, as e. g. to Lectures, Mechanical Drawing Practice, or Laboratory or Workshop Practice.

The fees for the Session are as follows:—

Lecture Class, one hour per week.....	£1 0 0
“ two hours “ “.....	1 10 0
“ three “ “.....	2 0 0
Drawing Practice, two hours per week. £1 5 0	
“ “ three “ “.....	1 10 0

Laboratory or Workshop Practice, each
additional period of three hours 1 0 0

Special fees are applicable in the case of foreign students.

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DAY COURSE FOR ENGINEER APPRENTICES.

These classes meet one day per week (Monday) from the 11th September until the end of May. They are intended for Engineer Apprentices and Apprentice Draughtsmen, who are nominated by their employers. Several engineering employers in the city have given their apprentices facilities for attending these classes, and it is hoped that a similar privilege may be given by other employers.

Students are required to attend on Mondays throughout the Session. The instruction is given from 9.30 a.m. to 4.30 p.m., with an hour's interval for dinner.

Candidates for this Course must have reached the age of 17, and must give evidence of a satisfactory knowledge of Mathematics and Mechanical Drawing.

The subjects included in the Course of Instruction are chosen from the following:—Practical Mathematics, Heat Engines, Applied Mechanics, Practical Geometry, and Engineering Drawing.

The Institute authorities are prepared to furnish periodical reports to employers concerning the progress made by their apprentices, and also to notify employers of any absences or departure from conditions laid down.

The fee for the complete Course is £1 10s.

DAY COURSES FOR PRINTING TRADES' APPRENTICES.

A Day Course in Typography has been provided for apprentice compositors who are nominated by their employers.

A number of printing firms give their apprentices facilities to attend these classes, and it is hoped that similar privileges will be given by other employers in the printing trades.

In this course, instruction is given in English, Printing Trades' Calculations, and the Theory and Practice of Typography.

The practical instruction is conducted in the newly-equipped Case Room of the Institute. The equipment comprises the latest patterns of labour-saving frames and case-room furniture, and includes a carefully chosen range of type faces, borders, etc.

The class meets on Tuesdays from 2.30 to 6.30 p.m., commencing in October.

Home exercises are given each week, and it is a condition of attendance at the Course that students work the examples set.

Reports are sent periodically to employers, and any absence of apprentices is at once notified.

An examination is held at the end of the Course, and certificates awarded to successful students.

EVENING DIVISION.

This Division has a Preparatory Section organized with the object of ensuring that students should obtain a sound basis whereon to build up their subsequent studies in Science, Art, or Technology.

There is also an Introductory Section, in which the Courses of instruction are so arranged as to lead naturally to the Specialist Courses. The students are, as far as possible, grouped according to their occupations. Special introductory classes are provided in the departments of Mechanical Engineering, Electrical Engineering, Chemistry, Building Trades, Textiles, Commerce.

An outline of some departments is given hereafter. In the belief that an outline would furnish a useful framework from which to work out appropriate details for Canada, only the materials of such a skeleton or framework are presented.

MECHANICAL ENGINEERING.

This Department provides instruction suitable for all grades of students in Mechanical Engineering, from those leaving the elementary school up to candidates for University degrees. The Courses are thoroughly modern, all unnecessary details of a purely academic character being eliminated.

The instruction is designed to afford a scientific training for all classes of students ranging from the young apprentice upwards. The student is led by easy stages from the most elementary to the highest branches, and the Courses present an opportunity for a high degree of training in the use of instruments, methods of measurement, calculation, reduction, drawing and designing, which are now, as the result of a better knowledge of principles, rapidly supplanting the old methods of arriving at engineering conclusions.

The object of the laboratory work is to train students in the practice of measurement of quantities—whatever their nature—which belong to the work of the engineer. The engineering industry is developing rapidly; extensive and often very costly experiments are constantly being carried out, so that in a shop which is thoroughly progressive every machine constructed may be looked upon as an experimental one. In order to grasp thoroughly the nature of it, and to enable young engineers to enter upon the experimental side of engineering, a laboratory training has become a necessity. The old method of training by class work alone has been found unsatisfactory. The recent great development in the methods of testing materials and machines has established this branch as an important part of engineering work, and this importance is increasing rapidly. The training necessary for such work is most efficiently obtained in a well-equipped laboratory in which the instruction is correlated with a course of scientific study.

NAVAL ARCHITECTURE.

Properly equipped drawing and lecture rooms are now provided for the teaching of Naval Architecture. It is essential that students of this subject should follow out a regularly arranged course of study, and for their assistance the following outline schemes have been prepared.

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1st Year.	{	Practical Mathematics, 1st Year.
		Naval Architecture, Stage 1.
		Practical Plane and Solid Geometry.
2nd Year.	{	Naval Architecture, Stage 2.
		Practical Mathematics, 2nd Year.
		Applied Mechanics, Stage 1.
3rd Year.	{	Naval Architecture, Stage 3.
		Practical Mathematics, 3rd Year.

In connection with these classes there are well-finished models illustrating the laying off and details of shell plating, etc., the models being used to illustrate the parts of the laying off and practical work done during the Course.

In the Elementary Stage instruction is given in detail drawing of parts of a ship's structure. In the Higher Stages students may prepare designs for passenger and cargo steamers, midship sections to pass the principal classification societies, and more advanced structural drawings, fairing lines, stern expansion, etc., etc.

PHYSICS AND ELECTRICAL ENGINEERING.

This Department has for its principal object the provision of complete courses of instruction in the theory and practice of the various branches of Pure and Applied Physics and of Electrical Engineering.

In drafting the programme, special attention has been given to providing for the requirements of the following, amongst others:—

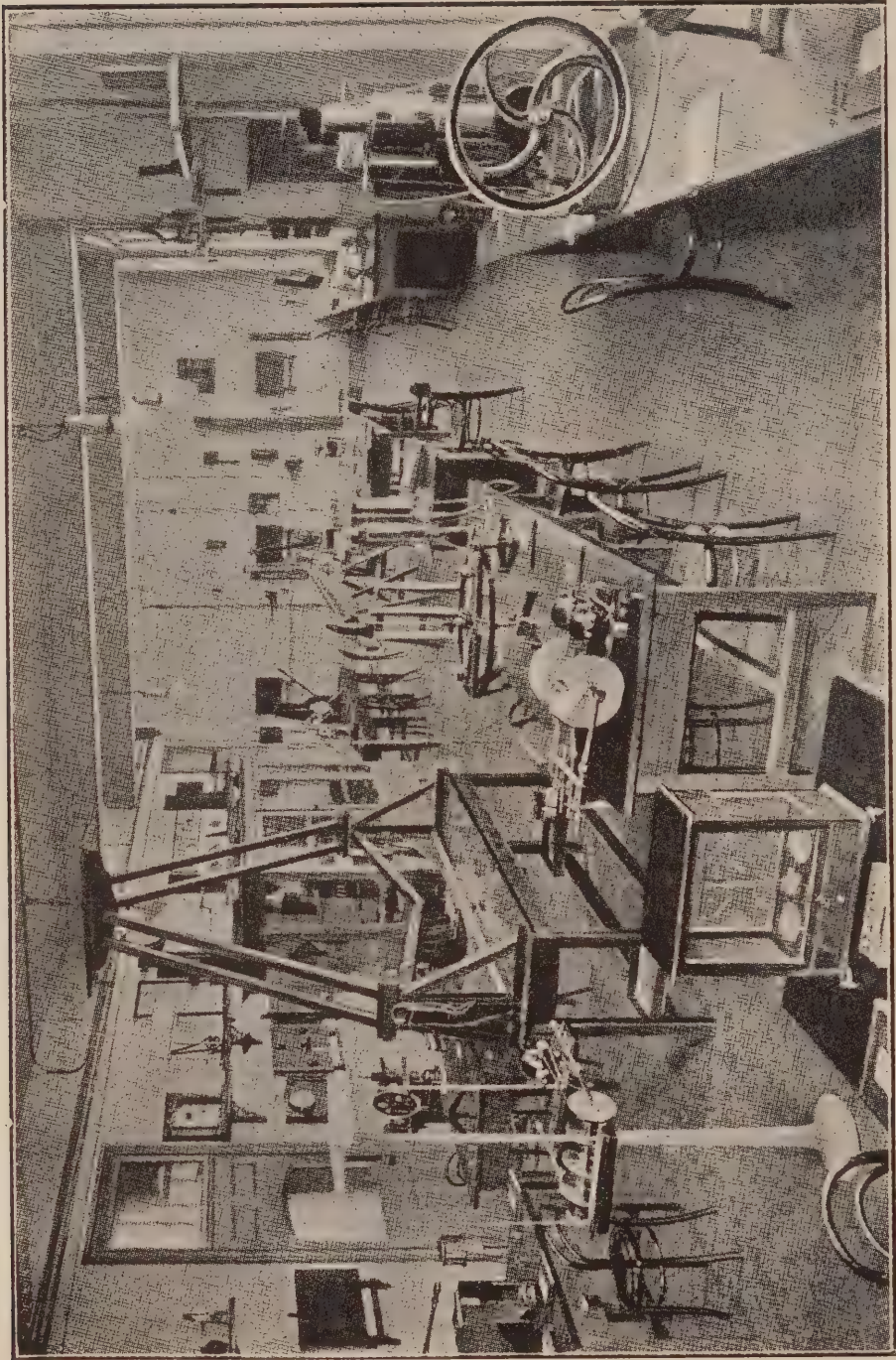
(1) Electrical Engineers; (2) Students whose main requirement is a knowledge of Experimental Science and Pure Physics; (3) Teachers in National Schools and in Secondary Schools desiring to obtain the qualifying certificates of their respective Boards; (4) Students preparing for the B.Sc. degree of the London University in the Departments of Science or of Electrical Engineering; (5) Telegraphists, telephonists, wiremen, and persons engaged in the inspection of buildings, sanitary work or insurance risks; (6) Those occupied in trades dealing with electro-deposition, or other branches of electro-chemistry.

BUILDING TRADES AND FURNISHING TRADES.

The programme of this Department includes a wide range of subjects, covering the leading branches of the Building and Furnishing Trades.

Considerable freedom is given to the student in selecting his Course. In imparting the instruction in the various classes the special requirements of the trade student and the professional student are constantly kept in view.

In the practical classes instruction is provided in setting out and constructing intricate pieces of work; students are enabled to gain thereby that experience and facility in setting out, and that skill in manipulation which will enable them to undertake such work on their own responsibility.



MECHANICAL LABORATORY: MUNICIPAL TECHNICAL INSTITUTE AT BELFAST.



BUILDING TRADES—PLUMBERS' WORKSHOP: MUNICIPAL TECHNICAL INSTITUTE AT BELFAST.

In addition, students are taught to take off the quantity of materials required, to prepare prices for work in the various trades, and to write reports in connection with building operations.

Students preparing for the various examinations in Building Subjects find the instruction given in these classes exactly what they require.

The equipment comprises five workshops, two lecture rooms, and two drawing offices. The lecture rooms are fitted up in a manner suiting their purpose, and contain charts and diagrams illustrative of the lessons given in the various classes.

EQUIPMENT.

The Building Construction Drawing Office designed to accommodate over 50 students, contains various models and diagrams of building construction details, as well as actual specimens of numerous building materials, and is in all respects planned for the convenience and comfort of the students.

The Joiners' Shop is planned to accommodate about 25 students; specially fitted up and equipped with all tools and appliances in connection with the joinery and cabinet making trades. A feature of the equipment of this room is an exceptionally fine set of models of wreathed handrails, for the use of students in the handrailing class.

The Wood-carving Room contains 23 single work benches, fitted with screws and appliances for holding the work. A varied collection of examples of wood-carving and plaster casts affords the student a wide range of selection.

The Painters' and Decorators' Workshop is fitted up in the most approved manner with work benches and easels. The room contains numerous examples of painting, decorating and lettering. Complete sets of tools used in the various branches of this trade are displayed in cases outside this room.

The Plumbers' Shop is a spacious room capable of accommodating 50 students. It contains a model roof with parapet, gutters, gutter boxes, steps, diagonals, chimney, flats, skewes, curb roll, circular dormer, storm window, entablature, and other details found on the modern roof; thus the student receives practice in fixing lead, copper, zinc, tiles, slates and other roof coverings. On the walls are arranged tanks, cylinders and boilers for experimental work in hot-water fitting. There are also complete models in glass of the various systems of domestic hot-water supply, which indicate clearly the circulatory movements and convection currents throughout the entire systems.

TEXTILE INDUSTRIES.

The object aimed at in the lecture Courses on Textile Subjects is to provide a thorough technical training in each Course. The Courses have been planned so as to meet the requirements of as many different sections of the textile industry as possible, due regard being paid to the attainment of efficiency and the avoidance of overlapping.

The lecture and class rooms are fitted up with every convenience for giving instruction in each branch of the work.

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This Department is equipped with the most modern and approved types of textile machinery.

Flax Preparing and Spinning.—This plant consists of a complete set of machines and apparatus for roughing, heckling by hand and machine, also spreading, preparing, roving and spinning machinery, suitable for linen yarns. Flax tow yarns can also be produced. The plant includes full-sized tow-carder, tow-comber, preparers, tow-rover, and wet and dry spinning frames. Twisting and reeling machines of two types are available for use and demonstration.

Hand Looms.—There are 26 hand looms by various makers; these comprise looms of different reed widths from 16 to 30 inches. The looms are mounted with a variety of warp shedding mechanisms, including treadle, witch and jacquard. Each jacquard machine, of which there are 13, is also mounted in a different way. All the foregoing looms are fitted up with rising and falling boxes at each end of the "lay," which makes it possible to produce a very considerable variety of linen and other woven fabrics.

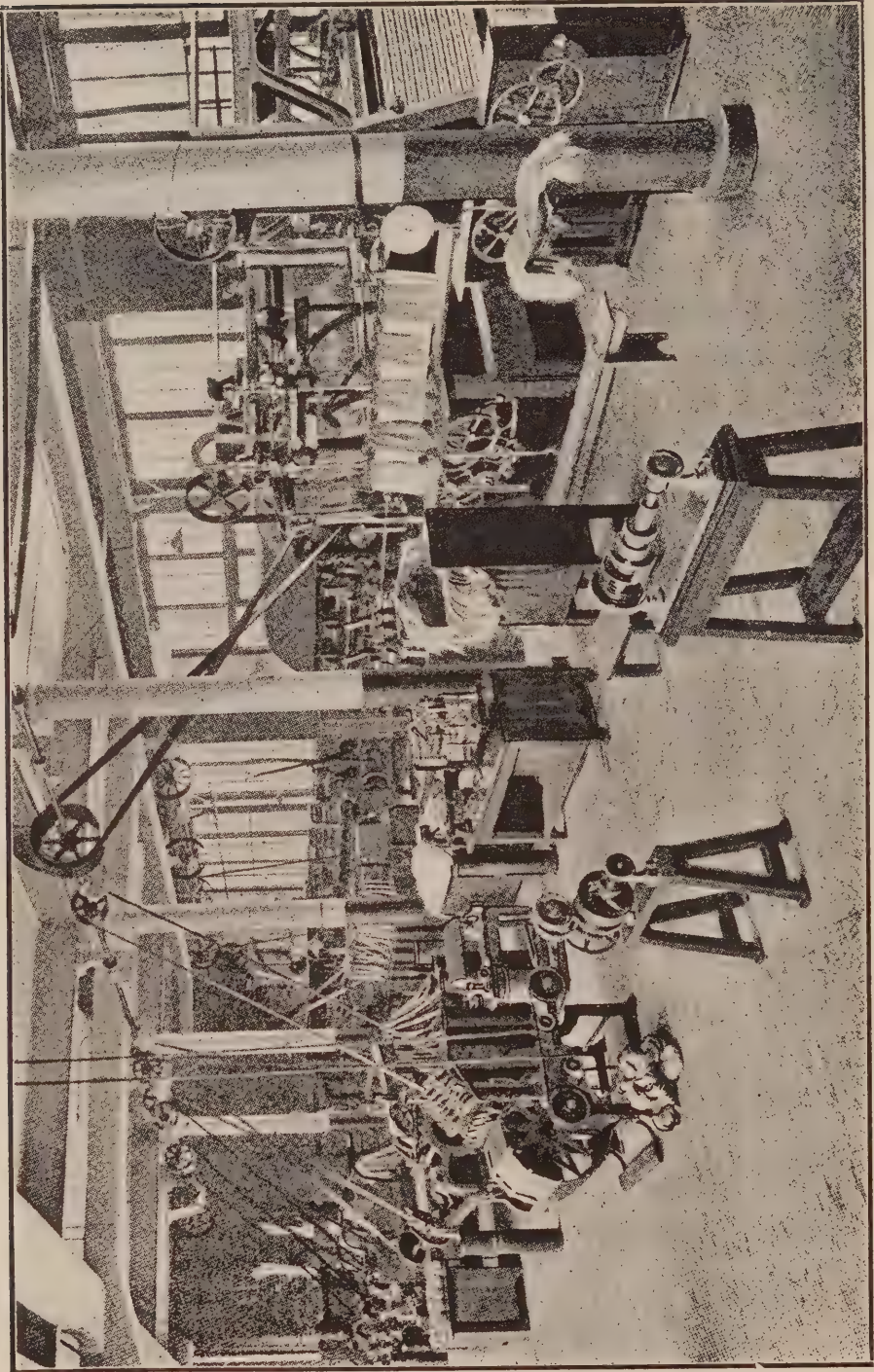
Weaving Preparation, Twisting, Winding, Card Cutting, Lacing Machinery, Etc.—Machinery and apparatus are provided for winding warp and weft yarns, warping by hand or machine, linen dressing and Yorkshire dressing and beaming. Card cutting and lacing machinery are also included.

Power Looms.—The Department is supplied with a considerable quantity and extensive variety of power looms and accessories. Every variety of linen fabric, together with all the chief varieties of wool, cotton and silk can be manufactured. This section of the equipment comprises 16 single shuttle looms of dissimilar widths, 4 of which are automatic pirn or shuttle changers. The looms are variously fitted up with negative (inside and outside) and positive shedding tappets; single and double acting and cross border dobbies; single and double acting, twilling and cross border jacquards of ordinary and fine pitch types. The systems of harness-mounting are comprehensive, including "London," "Norwich," pressure or common, split, leno and carpet methods for "repeating," "lay over," and cross-border patterns. There are also 5 even pick and 8 odd, or pick and pick at will, shuttle box mechanisms which are also variously mounted and capable of producing a wide range of woven products. A 4-shuttle positive pick tape loom together with a considerable number of working models completes the power loom section of equipment.

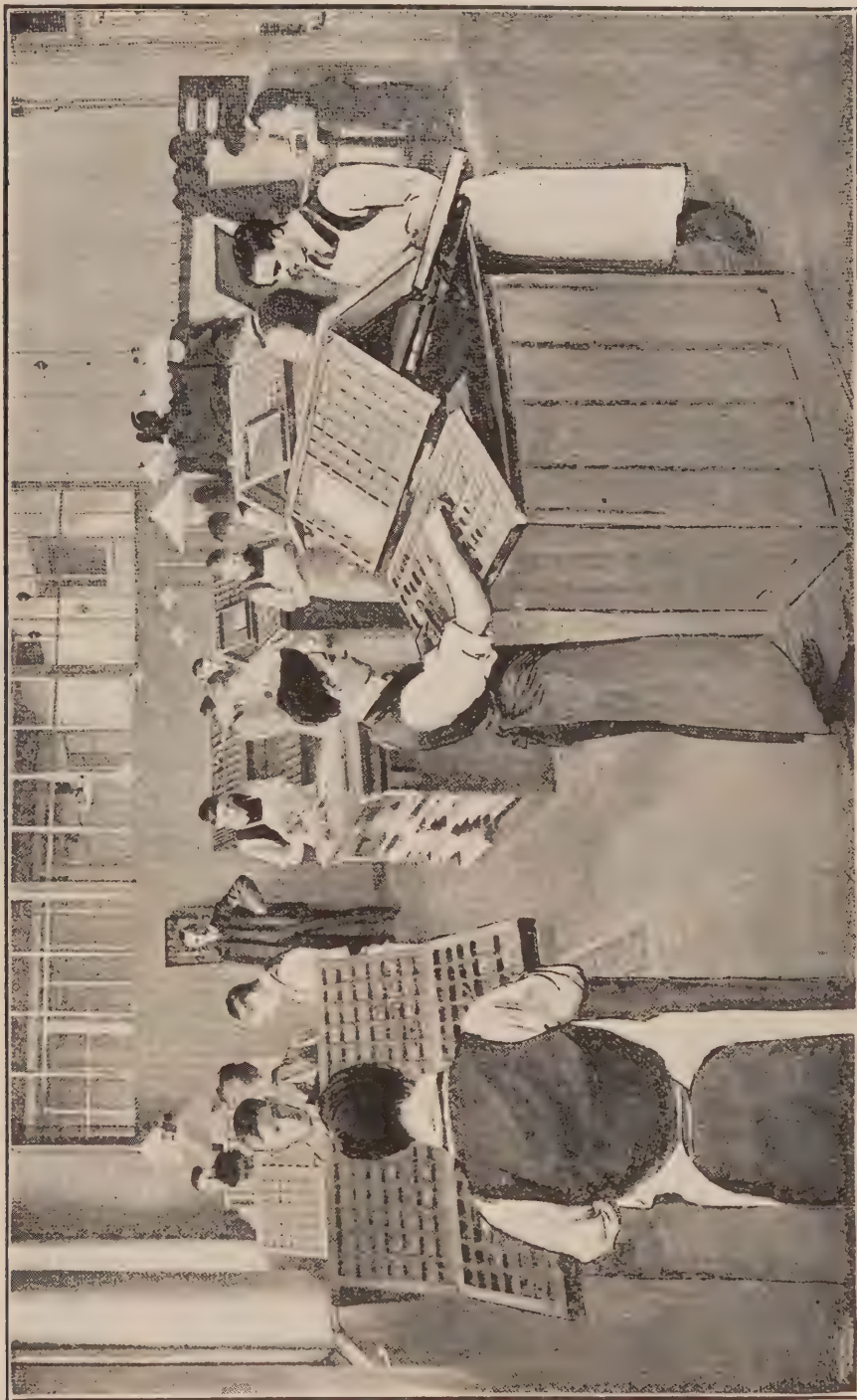
The Textile Testing Laboratory is equipped with instruments, apparatus and machinery for :—

Testing strength and elasticity of yarns; testing strength of woven fabrics; conducting microscopic tests of the various textile fabrics; weighing and testing correct weight and length of yarns; testing the twist in yarns; examining yarns for evenness; conditioning; conducting various chemical tests; determining relative humidity.

NOTE:—A special feature in the Weaving Department was as follows: Every student when he enters receives a number, indicating some experiment or work he is expected to do. He then finds an instructor in the Weaving Room who gives him the necessary information, guidance and help to get started on his project of work. Hand looms are used at first, to give all the students a



FLAX PREPARING AND SPINNING ROOM. MUNICIPAL TECHNICAL INSTITUTE AT BELFAST.



PRINTING TRADES DEPARTMENT—COMPOSING ROOM: MUNICIPAL TECHNICAL INSTITUTE AT BELFAST.

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knowledge of the fundamental principles of weaving. There is a large equipment of hand looms of different makes. After experience with these, the student passes on to the use of the power machinery for flax and linen weaving. A student who attends during 4 years will acquire a knowledge of all these different machines, and a clever workman is often able to adapt something from one machine to another, and to improve the work of the one he is on at the factory where he is employed.

PUBLIC TEXTILE TESTING AND CONDITIONING HOUSE.

This has been established in connection with this Institute with the approval of the Department of Agriculture and Technical Instruction for Ireland. It is carried on under the auspices of the Belfast Corporation, and is controlled by the Library and Technical Instruction Committee.

The functions of the Testing House are the examination of textile materials with a view to ascertaining and certifying their true weight, length, condition, and strength, and in addition, the carrying out of such other tests and investigations as may be required in order that spinners, manufacturers, merchants and others, desirous of having tests conducted and an Official Certificate issued, may effect their object through the medium of an independent public authority.

The strictest secrecy is observed with regard to all work sent to the Testing House; as a consequence, the Testing House is not open to the public.

PRINTING TRADES.

The Library and Technical Instruction Committee has established a Printing Trades Department, and has set aside an entire floor 92 ft. by 23 ft. in the extension of the building recently completed. The rooms are exceptionally well lighted, both in the day time and at night.

It will be the special object of these classes to provide a full range of training, so that the student who is limited to one kind of work in his daily occupation will have the opportunity of extending his knowledge to the other classes of work occurring in his trade. The instruction will thus supplement the practical training of the workshop, and provide the means of raising to a higher level the standard of craftsmanship in the various trades.

Technical instruction will be given in the following sections of the Printing Trades, viz.:—

Typography; The Linotype; Machine and Press Work; Designing for Lithography; Lithographic Printing; Bookbinding—Forwarding and Finishing.

The instruction in each branch will be both theoretical and practical. The programme will include such allied subjects as are necessary to render the instruction thoroughly efficient.

The classes will in general be held in the evening, but day classes will be conducted in those subjects for which there is a sufficient number of students.

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For the session of 1911-1912 the classes dealt with the elementary stages of the various subjects. As a higher standard of attainment is reached more advanced Courses will be introduced into the programme.

Each Course will call for attendance on two evenings per week.

Day Classes for Apprentices:—At the request, and with the cordial assistance, of a number of employers in the printing trades, the Committee has established an afternoon Course of instruction for apprentice compositors.

VARIOUS TRADES AND INDUSTRIES.

Under this Department come the Baking Trades, Confectionery, and Tailoring Trades.

NATURAL SCIENCE.

Under Natural Science are taken up, Botany, Biology, Physiology and Hygiene, and First Aid to the Injured.

PURE AND APPLIED CHEMISTRY.

This Department provides classes which will suit almost anyone who requires a knowledge of chemistry in his daily work, whether he be engaged in a chemical trade or preparing for a profession.

Modern views on the teaching of chemistry require that fully as much attention shall be paid to laboratory work as to theoretical instruction. The Chemical Department will be found to be adequately equipped for giving practical instruction in all grades of chemistry.

The two lecture-rooms, capable of accommodating 100 and 60 students respectively, are provided with large and well-fitted lecture-tables, fume cupboards, lantern and diagram screens, etc. Between them, and accessible from both, is the preparation-room. The lecture apparatus, the collections of specimens, of lantern slides, and of diagrams are very complete.

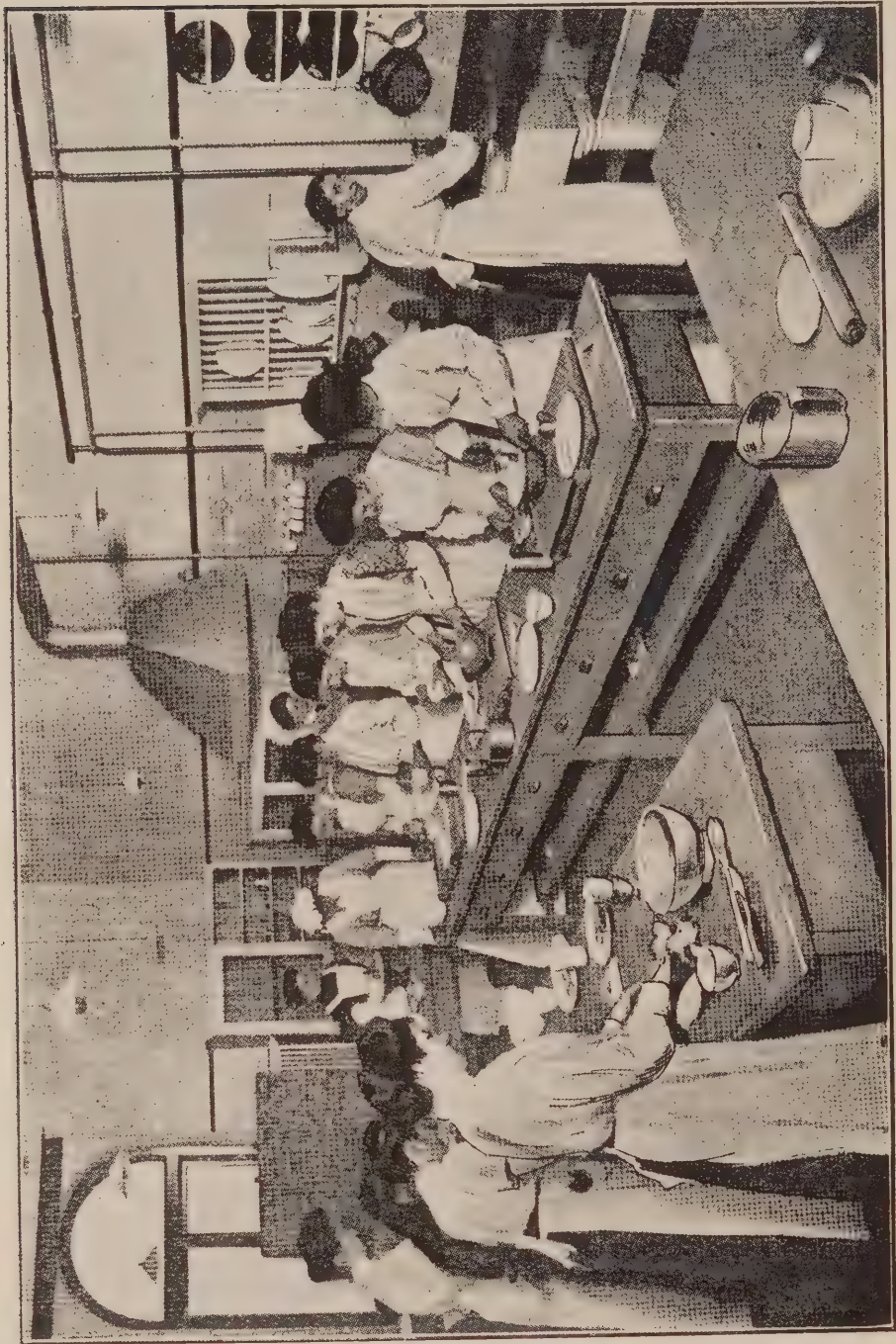
Laboratories:—(1) The main Chemical Laboratory contains 80 working benches, and has separate locker accommodation for over 200 students. Fume cupboards, drying ovens, evaporating niches, and distilled water plant are provided, and there are special benches for furnaces and glass-working. A balance-room and small store for apparatus open off the laboratory.

(2) A small Chemical Laboratory, similarly equipped to the above, is provided in connection with the Bleaching and Dyeing section of the Department.

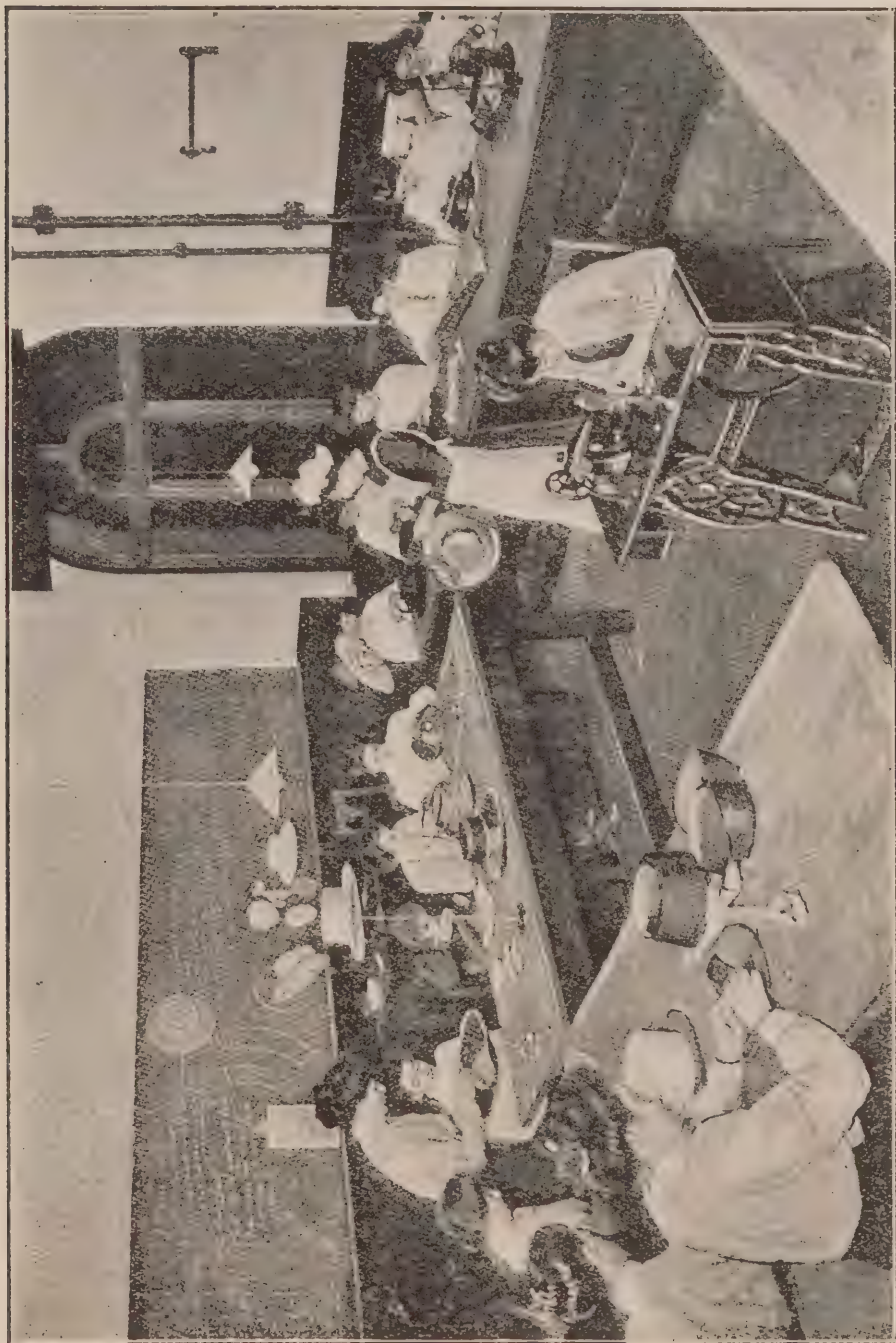
(3) The Bleaching and Dyeing Laboratory is equipped with 16 sets of steam-heated experimental dyebaths, used for carrying out small-scale experiments in dyeing, scouring, etc.

(4) A Finishing and Laundering Room has just been added to the Department. This contains additional machinery for the bleaching of yarn, and complete plant for the finishing of textiles and the study of laundering problems.

(5) A Laboratory has now been fitted up and set apart for the non-chemical work of the Pharmaceutical section.



COOKERY CLASS: MUNICIPAL TECHNICAL INSTITUTE AT BELFAST.



MILLINERY CLASS: MUNICIPAL TECHNICAL INSTITUTE AT BELFAST.

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DEPARTMENT OF COMMERCE.

The object of this Department is the provision of systematic Courses of practical instruction in the technique of Commerce. In the classes students are able to acquire that technical knowledge and specialised training which are necessary for present-day commercial administration. Whilst class work cannot provide the natural aptitude or the will-power and perseverance upon which success in business largely depends, it does undoubtedly develop the first-named quality and stimulates the others. The greatest efficiency cannot be attained without a systematic study of commercial subjects, to provide opportunities for which is the aim of the Department.

The rooms have been specially adapted and equipped for commercial instruction. An adequate supply of suitable apparatus, including the most modern time and labour-saving devices, has been provided, and the environment of a well organized business house has been reproduced, as far as possible. The Institute Library is available for students, with books and magazines of much service to them in their studies. The various classes are well provided with useful teaching auxiliaries such as models, charts, maps, etc., and the lantern and gramophone are also used as opportunity offers.

Owing to the development of commerce and the increase in specialism in commercial occupations, the greatest efficiency in these occupations can only be attained by students learning thoroughly the technique of their own and allied businesses. For this reason the Course system has been introduced. In order to economise time and effort, a student who wishes to make progress in his commercial education should undertake a carefully arranged Course extending over about 3 years. It is not deemed possible to lay down in advance suitable Courses of study for all students, but typical Courses appear in the Prospectus.

The Department offers instruction in a wide range of subjects, and the number of subjects is to be increased as the demand arises. The needs of both junior and senior students have been considered and arranged for, and it is possible to prepare in these classes for almost any commercial position.

An Introductory Course, covering instruction of a general character, has been arranged for students who are not yet prepared to take up a specialized Course. Junior students are recommended to consider carefully their requirements before entering upon a course of study. They should remember that it is only on a satisfactory educational foundation laid in the elementary classes that a student can hope to attain success in the advanced Courses.

Classes in advanced subjects have been increased in numbers and variety. There is to-day a great demand for persons who can efficiently discharge the duties of the higher and more responsible positions in business. To fulfil these duties in a satisfactory manner a wide and liberal training is necessary, as well as an extended outlook. To meet this demand the work of the senior classes, whilst providing technical knowledge of an advanced character, aims at enlarging the student's conception of commercial organization, and training his mind to analyze new commercial situations.

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The necessity of keeping the work as practical as possible, by maintaining a close connection with business administration and developments, is never lost sight of; and to this end much of the instruction given in the Department is entrusted to teachers and lecturers who are themselves engaged in business.

THE SCHOOL OF ART.

The objects of this School, which is a part of the Municipal Technical Institute, are to give, by carefully arranged and varied Courses of study, a thoroughly practical knowledge of Design, Painting, Drawing, and Modelling, especially in their application to the various technical processes of manufacture and handicrafts, and in their relation to Architecture. It furnishes useful training to those intending to work as architects, designers and craftsmen, and assists those who wish to follow up Design in its bearing upon pictorial composition, such as book decoration, book illustration, and wall posters.

In addition, it is the object of the School to assist those who desire to make Art a part of their general education, and to spread a knowledge of Art and the appreciation of Art work; also to give facilities to those wishing to follow Art as a profession, or to include it in their general qualifications as teachers in Public, National, Art, or other Schools.

The special needs of the City of Belfast are steadily kept in view, so that the public interest in Art work of all kinds may increase, and that the portion of its commerce and industry dependent more or less on the arts of Drawing, Design and Handicraft may be benefited.

EXPLANATION OF THE COURSES.

The stages of instruction are arranged progressively, and students are required to conform to the Course prescribed for them. The Courses are made to meet the requirements of the students and to train them for their respective professions, every consideration being given to individual preferences and capacities. The classification of students rests entirely with the Head Master, and intending students who already possess some knowledge of drawing will be admitted to the Courses at a point suited to their abilities. They may be required to pass an entrance test, and are advised to bring specimens of their work when applying for admission, in order to facilitate classification.

The Three Grades or Stages.—The instruction is broadly divided into *three grades or stages*, and a student passes from a lower to a higher stage on fulfilling certain conditions to the satisfaction of the Head Master, who, along with the teacher in charge, periodically examines the work of individual students. Generally the changes take place about every three months.

The three Grades or Stages are:—(1) Preparatory, (2) Elementary, (3) Advanced. These are carried on during the day and also in the evening.

The Preparatory Course comprises work equal to what would be expected in the upper classes of elementary schools, in evening continuation drawing classes, or in the junior classes of secondary and private schools and colleges.

The work done in this Course consists of short time studies completed at each lesson, supplemented in some cases by home-work, based on the class work.

Intending students who have sufficiently covered this Course along with their general education, will immediately pass to the next stage.

The Elementary Course is equal to the upper grades of Secondary Schools working under the Department's new programme, but is somewhat more extended. It is also similar to the general Courses provided in evening Art classes in smaller towns, or in branch Art classes in larger towns. The work in this Course is of a general character and covers the foundation of all the higher branches of Art work. It will be found suitable as an adjunct to a good general education, and as a help in any division of life's work; the variety of work will enable the student to discover the particular line he or she would care to follow up in the higher branches of study. The Course will be helpful to students of various stages of science and technology, such as textiles, and it forms a Course necessary to be mastered as a minimum qualification for all teachers in National, Intermediate or Private Schools.

Short studies will be completed at each lesson, but more finished studies carried on over a lengthened period may be made by competent students. In some cases the work may be supplemented by home work.

In the *Advanced Course*, the provision made in each section permits students to continue their work and studies to a very advanced stage. A few particulars from Section 2 indicate the scope of all the sections. In addition to the lecture classes in the Principles of Design and the History of Applied Art, there are practice classes for Advanced Design; Figure Composition; and Artistic Handicrafts, as follows: (a) Artistic Handicrafts (not requiring special equipment); (b) Artistic Enamelling; (c) Artistic Metal Work; (d) Artistic Needlework; (e) Stained and Leaded Glass; (f) Lace-making; (g) Writing, Illuminating and Lettering.

CHAPTER XXVI: THE ARTANE INDUSTRIAL SCHOOL.

One of the institutions in the vicinity of Dublin, visited by the Commission, was the Artane Industrial School for boys, conducted by the Christian Brothers. Industrial Schools of this type are in a class by themselves, and are not to be considered as constituting a part of the industrial and technical education conducted under the Department of Agriculture and Technical Instruction. However, as there are a number of similar institutions in Canada, it has been thought appropriate to include a brief statement regarding this school, which impressed the Commission most favorably.

The Irish Industrial Schools Act became law on the 29th May, 1868. Industrial Schools in Ireland are strictly denominational. They are established either exclusively for Catholics or exclusively for Protestants. There are 21 for boys and 46 for girls, and one mixed. Of these 18 are for Roman Catholic boys and 3 for Protestant boys; 43 are for Catholic girls and 3 for Protestant girls. The Industrial Schools in Ireland are not to be confounded with Reformatories. The latter presume the juveniles to be guilty of some offence, whereas children are sent to the Industrial School because of destitution, want of proper guardianship and similar causes.

WORKSHOPS FOR BOYS.

The Artane School was certified, in 1870, as suitable for the reception of boys. At the time of the visit of the Commission there were about 800 boys at the institution. The institution has a farm and many of the boys are trained for agricultural pursuits. From time to time workshops for various occupations have been added, until now there are 12 workshops in active operation. These include a workshop for each of the following departments:—cabinet making, painting and decorating, house carpenters, weaving, cart and wheelwrights, tinsmiths, tailoring, fitters, boot and shoe making, flour milling and baking, harness making, forging shop.

APPRENTICES IN JUNIOR DEPARTMENT.

In a juvenile workroom printing is taught; and the repairing of the clothes of the boys is taught systematically and carried out efficiently to cover the needs of the institution. A feature of the instruction in this room is worth mentioning. Here all the young boys begin their education in practical work by mending clothes, darning, knitting and making new garments for the boys of the school. What is known as the "dual system" was in full swing among the busy little workers. The older pupil was called the "master," and was

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assisted by an "apprentice." After one year the apprentice in turn became master and took an apprentice. The older boy has in each case a younger boy in training, helping him to understand and use the various machines. The boys in this Department were from 6 or 7 to about 12 years of age.

TRADE TEACHING ON A COMMERCIAL BASIS.

After the general work in the juvenile workroom each pupil is passed into the department of the particular trade selected by or for him. The boy is never coerced into any particular trade. The selection is an advisory one, made only after a careful study of his nature and consideration of his parentage and the occupations of his relatives. After he is put to a trade he is not allowed to change to another.

Instances from one or two trades illustrate the range of work undertaken in each of the trades. The boys make their own clothing "from the sheep's back to the boy's back," as it was expressed. They also weave their own blankets. Another instance: the school grinds its own wheat, some of which it buys from the neighbouring farmers and some of which it imports.

The output from some of the trades is sold in the usual way of business, and the excellent work had won for the school a good name. In the tinsmiths' department the boys were filling a big order for oil cans for one of the railways. In the cart and wheelwrights' department, wheelbarrows and carts were being repaired for neighbouring farmers and others.

EQUIPMENT, DISCIPLINE, PHYSICAL TRAINING.

The equipment of each department on the industrial side was quite suitable for the training of boys to be competent workers in the trades concerned. The keenness of the boys in the work of the various departments was an outstanding feature; and discipline in the industrial department was evidently maintained not by compulsion, but by intelligent interest.

There are 11 school rooms in which the boys go through the ordinary school course. In this department the boys are able to earn grants paid by the Board of Agriculture and Technical Instruction for Drawing. There is also a three years course in Manual Instruction to which each boy devotes 3 hours per week. All the boys go through these classes, irrespective of the trade they propose following.

The school is equipped with a theatre, a concert hall, infirmary, chapel, and commodious dining room.

Much attention is paid to physical training for the development of the boys. Opportunity is provided for supervised play and games. For a number of years the boys had a renowned football team, which won such a surfeit of prizes that they have now given up going out for contests. There was also an instrumental band of between 70 and 80 boys, which had such renown that it was taken over to Meynooth when the King visited there. An immediate result, from the music, was evident in the marching of the boys, their going into and being seated in the dining room, etc.

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The appointments of the bathroom, containing 52 shower baths, enabled a set of boys to receive their benefit in 20 minutes. The arrangements provide privacy for the boys and for expedition in bathing. The appointments and condition of every part of the institution were noteworthy for the cleanliness and orderliness which prevailed.

CHARACTER BUILDING AT A SHILLING A DAY.

Considering the class from which these boys were drawn—waifs and strays—the boys had a remarkably healthy, happy and vigorous appearance. Ruddy cheeks and vivacity of movement bespoke wholesome development. The atmosphere of apparent contentment, interesting work, quick obedience to directions, were all indicative that the general education made for character-building concurrent with the teaching of particular trades under the care of teachers who were specialists in those trades.

When a boy leaves the institution he receives a small outfit consisting of two suits of clothes, with underclothes, etc. Considering the excellence of the conditions provided, and the results in those matters which have been referred to, the efficiency of the business administration is evident from the fact that the whole cost of the institution amounts to only about one shilling per day per boy. That was possible only because the work on the farm was done largely by the older boys, and a certain amount of food came from that source. The work of the boys in the industrial department also brought in some revenue.

After going over the institution, one could not help being impressed with the thought that the training received by these boys—originally waifs and strays—gave them a more thorough and suitable preparation for living and working than is obtained by most boys whose parents are in relatively poor circumstances. The kind of work done by the boys, and the atmosphere in which it was done, kept awake the interest of the boys themselves and caused it to pervade all school work. One retains a sense of grateful appreciation of the labours of the 27 Brothers, and their corps of assistant workers, on behalf of the young unfortunate, fortunate, lads who come under their care.

DENMARK.

CHAPTER XXVII: THE COUNTRY AND ITS PEOPLE.

INTRODUCTORY.

Denmark is a country whose geographical position, area and population permit it to be thought of as a whole in such a way that lessons from the development of its agriculture and rural education may be understood. It consists of the peninsula of Jutland and of a number of islands in the Baltic Sea. The area is about 15,500 square miles. Its population in 1911 was 2,757,076, almost wholly Scandinavian, only 3 per cent being foreign born.

The area of land in farms is about eight million acres (8,177,169), and a good deal of it is of indifferent quality. The rural population amounts to 20 persons per 100 acres.

Outside of the city of Copenhagen, which contains about one-fifth of the total population of the Kingdom, three-fifths of the people live in the country itself, and the other fifth in the country towns. About 25 per cent of the population depend upon manufacturing and building industries. The principal items are machinery, pottery, paper and bricks. The number of beet-root sugar refineries is increasing, and breweries and distilleries are decreasing.

The climate resembles that of the eastern coast of Great Britain; and for crop-growing it is not greatly different from that of eastern Canada. The winter is less severe in temperature than in Canada, with a much lighter snow-fall; but is scarcely less prolonged or taxing on comfort, by reason of the prevalence of winds and the relative humidity of the air.

THE APPEARANCE OF THE FARMS.

The land has generally a slightly rolling surface, and the absence of fences gives it an aspect uncommon in Ontario or Quebec. Everywhere the cattle and horses and a few sheep are tethered. In summer they graze usually upon sown crops and not upon permanent pastures. To move the animals three or four times a day and to water them involves a good deal of labor. The Danish farmer does not mind that. He seems to regard his farm as a factory for the turning out of valuable products from which he derives and retains reasonable profits. Evidently he does not count a large area of land either necessary or conducive to the profits of his business, unless he does enough business and has labor of sufficient volume to occupy and use the land to its full extent.

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The fields observed were generally reasonably free from weeds, and the crops were even in stand, giving evidence that the farm work had been well done. Fields of clover were conspicuously numerous, and alfalfa was seen occasionally. The crops of mangolds and potatoes were abundant and looked particularly well. Within the last quarter of a century the area planted with root crops has increased from 46,000 acres to over 600,000 acres, chiefly in mangolds for cattle-feeding. There has also been enlargement of the area in sugar beets for the sugar industry.

Many of the farm buildings and surroundings had the appearance of being kept by people who appreciated beauty in the surroundings of their homes. One was struck by the kind of pictures seen on the walls of even a Husmand's (cottar's) house. There were plenty of good photographs of spots of beauty, inexpensive copies of pictures by great masters, and no tawdry display of gaudy chromos.

The roads were generally well made and in good order for ordinary traffic.

None of the farms, in appearance of crops or general environment, were equal to the best farms in England or Scotland. They could not be considered superior to some of the best farms in Canada. What struck one most impressively was the high level of farming on small and large holdings alike. The Danish farmer, because an intelligent man, is also a thrifty and economical manager. He can get along, make improvements and save money on a much smaller area than satisfies the Canadian farmer.

SIZES OF FARMS AND HOLDINGS.

The sizes of the farms reveal conditions essentially different from those which prevail in Canada. A return published in 1907 puts the total number of Danish rural properties at 250,083. Of these about 70,000 were holdings of under one and a third acres each. The following table enumerates all the other holdings, viz., those having over one and a third acres:—

No. of Holdings.	Size in Acres.	Total Area in Acres.
46,614*	1 $\frac{1}{3}$ — 7 $\frac{1}{5}$	179,604
16,988	7 $\frac{1}{5}$ — 11 $\frac{1}{4}$	159,832
28,992	11 $\frac{1}{4}$ — 22 $\frac{3}{8}$	473,598
17,723	22 $\frac{3}{8}$ — 33 $\frac{3}{4}$	496,962
35,257	33 $\frac{3}{4}$ — 67 $\frac{1}{2}$	1,752,121
25,615	67 $\frac{1}{2}$ — 135	2,346,295
6,502	135 — 270	1,169,484
1,570	270 — 540	574,946
822	540 & over	964,327

*Some of these may have less than 1 $\frac{1}{3}$ acres each.

From the above table it will be seen (putting statements in round figures) that about 2,400 holdings, of over 270 acres each constitute about one and a half per cent of the total number of holdings, and comprise fifteen per cent of the total area.

Holdings.	Percentage of total Holdings.	Size in Acres.	Percentage of total Area.
2,400.....	1½%	over 270	15%
6,500.....	3½%	135 —270	14%
171,100.....	95 %	1½—135	70%

The group of 171,100 holders may be roughly described as 63,000 with holdings of from 1½ to 11¼ acres each; 47,000 holdings from 11¼ to 33¾; 61,000 holdings from 33¾ to 135 acres. This ratio of working-owners to acres of land indicates the necessity for intensive farming; and taken in conjunction with rural education, co-operation and organization, accounts for the great increase in the number of cows, pigs and poultry maintained, and the enormous increase in the volume of the exports of butter, bacon and eggs.

FRUGALITY, CO-OPERATION, EDUCATION.

The country is one, in the main, of peasants and small farmers. They had the appearance and bearing of intelligent, well-dressed and self-respecting people. The farms, almost without exception, showed every outward sign of frugal prosperity. The farmers seemed satisfied with their lot, their progress and the outlook for the future. Notwithstanding a moderate stream of emigration (8,890 in 1910), there has been a steady and considerable increase in the rural population. The numbers of the rural population, in round figures, are given as follows:—In 1880, 1,400,000; in 1900, 1,500,000; in 1910, 1,700,000.

Various observers and students of agricultural situations, with whom the question was discussed in Denmark and elsewhere, attribute the country's marvellous progress to different causes, or lay emphasis upon one or other of different factors. It is admitted and asserted by many that Denmark owes its prosperity in large measure to the co-operative movements. Others, perhaps exercising greater insight, attribute the progress of the co-operation movement itself, and the concurrent advance in agriculture, to the character of the Danish people, which made co-operation practicable and made them desirous of joining in it.

Others again, pushing their quest still further, claim that the general education of the people, more particularly that provided through the People's High Schools, made them willing and able to accept and act upon the ideas and suggestions of the leaders, who saw what could be done with the greatest advantage to the whole people. Here the efforts for education and the efforts for

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co-operation shade into each other, and both are conditioned by the race qualities of the nation. Moreover, co-operation for production, for preparation for market, for marketing and for buying are in themselves agencies and instruments of education. Participation in such activities quickens the mental aptitudes, and, by rendering the people more self-reliant, makes them more responsive to expert advice and able to make it fruitful in their own affairs.

INTELLECTUAL AND SOCIAL PREPARATION.

What is noticeable is that the masses of the people on the farms are advancing together; that their leaders come from all ranks, so far as the size of the holdings is concerned; and that whatever has been found to be a good plan or an excellent practice in one locality quickly becomes the knowledge of all the farmers, and is applied with the modifications necessary to suit their conditions. In the co-operative organization the Husmand, with a holding of only a few acres, has one vote; the large farmer, with many times the quantity of produce involved, has one vote and no more. This recognition of the human, rather than only the property interests involved, is worth thinking about.

It is not probable that the Danish people would have been able to follow out the improvement of their agriculture, to organize co-operative creameries, packing factories, etc., and to profit by the inventions of the time had they not for years had the advantages of processes of intellectual improvement. When co-operation became necessary to enable them to hold their own and to capture the British market for butter, bacon and eggs, they were intellectually and socially able to develop it.

The following table indicates something of the rapidity and extent of the change in the agricultural industry during the past 30 years:—

	1881. (Value in round figures)	1910.
Exports of butter.....\$	9,200,000	\$ 50,500,000
“ bacon.....	2,000,000	34,000,000
“ eggs.....	300,000	7,000,000
Total.....\$	11,500,000	\$91,500,000

INTELLIGENCE AND PERSISTENCE.

The improvement in the milking cows furnishes another example of the intelligence and persistence with which the people have co-operated to improve their instrumentalities of production. The soil fertility has been increased by better systems of cropping, and the land further enriched by the manure from the immense quantities of grain and other feeding stuffs imported from abroad. At the same time the improvement in the productive capacity of the individua

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cow has been much more notable than the growth in the number of animals. The following table sheds considerable light on that situation.

	No. of Milking Cows.	Value of Exported Butter.
1893.....	1,011,980	\$ 18,720,000
1903.....	1,089,073	40,320,000
1910.....	1,280,000	50,500,000

The number of milking cows had been increased by less than 16 per cent. and the value of the butter exported had increased by more than 169 per cent. The increase in the value of the exports of butter is not a true measure of the production of milk. However, one of the dairy authorities in Denmark states that better care and better feed, within the last 30 years, increased the annual yield of milk about 3,000 lbs. per cow. That accounts for \$30,000,000 a year in butter. Professor Boggild, a great authority in dairy matters, puts forward the statement that the average yield of milk of the Danish cow in 1908 was 6,170 lbs. In the Isle of Fyen, which has some of the best land in the kingdom, 20,000 cows gave an average yield of 8,100 lbs. of milk each in 1910.

CO-OPERATION AND ITS RESULTS.

The co-operative organizations may be grouped into three large general classes:—

(1) Co-operative organizations for production, such as co-operative creameries (begun 1880), co-operative meat packing plants (begun 1887), co-operative societies for the exportation of eggs (begun 1890), co-operative beet-sugar factories.

(2) Co-operative Societies for analysis and constant improvement of the branches of production; co-operative societies for the breeding of live stock; "Control" societies, etc.

(3) Co-operative Societies for the purchase and distribution of things to be used or consumed in connection with the carrying on of the agricultural work and the homes and life of the people. These things may be taken chiefly as feed for animals, fertilizers, and in some cases seeds, machinery and implements. The first of these Societies was established in 1886, but the movement spread generally from the beginning of 1880. The capital for most of these undertakings is raised by borrowing the amount, for which the members of the Society are collectively responsible.

One is warranted in ascribing to general co-operation amongst the farmers results which in turn become causes of other results. These may be put as follows:—

(1) The development of an attitude of mind towards other farmers and other interests in the locality.

(2) The broadening of the outlook by participation, even to a small extent so far as contribution of property is concerned, in building up and improving the local industry or interest.

(3) The education into ability, for social and public affairs, by active participation in the affairs of the co-operative society or association. The

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small farmer, in his degree and according to his output, is put on an equal footing with the largest producer and does proportionately well. The natural leader in business matters is developed, discovered and followed. The man whose ability is chiefly in the direction of talking much and talking well finds his place also.

(4) The relief of the small farmer from some risks of marketing by himself, with the waste of time entailed thereby, and the benefit to him through the larger and stronger organization being able to furnish large quantities of produce of a reasonably uniform quality with fair regularity. Through the Co-operative Society or Association his interests, which of themselves would not be financially large, are served as well by trained men as are those of the largest producer.

(5) The freeing of his mind to attend to the producing or production end of the business on his farm.

(6) The putting of the small farmer in a position whereby he is sure to obtain expert advice from some officer or member of the Society or Association or through it from a government officer.

OPINION OF COUNT CARL MOLTKE.

In an address delivered before a "Conference for Education in the South," at Jacksonville, Florida, in 1911, Count Carl Moltke, Minister from Denmark to the United States, presented a view of some of the differences in the results which have followed from education and co-operation among a rural people in Denmark and those consequences which are likely to ensue where "capital rules supreme, with education as a by-product." Count Carl Moltke said:—

By good farming we mean modern, scientific farming. Farming now-a-days demands the application of modern methods as fully as any branch of manufacture; it has no use for the primitive or the unintelligent. Hence a population that is going to make a success of farming is in greater need of education than a manufacturing population, because while the latter can be directed by a few shining lights in the community, the farmer is often isolated and has to depend much more on his own resources than does his industrial brother.

Count Moltke concluded:—

The time when all their (the peasants' or farmers') skill and energy was required—in the 80's—had been preceded by about a century of gradual progress of intellect; it was accelerated by commercial necessity and to a certain degree as a reaction against their natural isolation in rural seclusion from other classes of the people. The prosperity of the country, the magnitude of its trade, its influence on the economic life of the nation in other branches, such as manufactures, is all the making of these modest people without initial capital. How different is such a process from that which results from huge, foreign investments, eager to reap enormous dividends from the labour of a nation economically not fully developed and which may be rushed into semi-civilization by the alluring requirements of powerful undertakings. But, whatever material prosperity may be the outcome of such conditions, it carries no guarantee of harmony, of respect for law and order, and of mutual consideration in the communities which participate therein. The fundamental difference between the two systems is that in the former capital was made a secondary force, sustaining the never-ceasing, unselfish efforts of the pillars of society—the teachers of the people; whereas in the second instance capital rules supreme, with education as a by-product that may fail altogether.

Without high-minded, self-denying men, who teach for the love of their science, love of their country, you have no means of setting a standard for communities, of making them law-abiding, good citizens as well as able tillers of the soil. Therefore, before anything, get good teachers first. Make the instruction attractive to the young men and women on a sound, moral basis, and keep them alive to the responsibilities they assume towards faithful stewardship of what may sooner or later be entrusted to them. In this way, you will have farmers who love their homes, their soil, and their country, and who will form the very element of true conservatism, without which every democracy is bound to decay.

CHAPTER XXVIII: OUTLINE OF THE EDUCATIONAL SYSTEM.

SECTION 1: DANISH NATIONAL SCHOOLS.

The foundation of the National School of Denmark was laid in the Law of July 29, 1814, the provisions of which are still largely in force. The Law defined the administration of the National School. Compulsory school attendance and a system of fines for neglect and truancy were then introduced; regulations were made for the arrangements of studies, for examinations, interior arrangement of school houses and teachers' dwellings, and appointment and remuneration of teachers. Instructions for School Boards and teachers were also included.

The next important legislation was the Law of March 8, 1856, which established the School Funds and contained regulations regarding number of pupils in school, school houses, remuneration of teachers, vacancies, superannuations and Widows' Funds.

In 1867 and 1868 the local administration of Public School matters was organized by dividing the administrative functions between the Municipal Council and the School Board.

During late years, new laws had been passed determining the limits of compulsory school attendance, the plan and scope of studies, appointment and remuneration of teachers, vacancies and superannuation, formation of Teachers' Councils, and school grants.

THE ADMINISTRATION OF THE PUBLIC SCHOOL.

The National School of Denmark (Folkeskolen) is a State-aided municipal institution. Large appropriations are made in each year's budget towards the payment of teachers' salaries and pensions, interest on school debentures, and school purposes generally in needy municipalities. The total appropriation for public school purposes for the fiscal year 1912-13—exclusive of the grants for Normal Schools (Seminarier) and for the training of teachers—amounts to nearly \$1,620,000.

Public School matters are administered by the Department of Ecclesiastical Affairs and Public Instruction according to the laws, rules and regulations made in that behalf. The Department, with its legally trained staff, is assisted in the administration of school matters by educationists, and by branch specialists in music, drawing, manual training and physical drill.

Each of the country's "Deaneries" or divisions of diocese, about 80 in number, has in the District Board a supervising authority, consisting of the Chairman of the County Council, the "Amtmand," or principal civil officer of the County appointed by the Government; the Dean, and a third elective

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member. This Board has the general supervision of public instruction within the Deanery, and reports annually to the Department on the condition of the schools. In several matters this Board has the power of final decision.

MUNICIPAL COUNCIL'S MANAGEMENT.

The management of school matters in the individual municipalities is vested in the Municipal Councils; in urban districts, in City or Town Councils; and in rural districts, in the Parish Councils. In both cases the Council works in conjunction with the local School Board. The financial matters of the school are managed by the Council, while the supervision of the teachers and their work is vested in the School Board, consisting of the Incumbent of the Parish as chairman, with several associate members elected by the Council to serve 4 years. The School Board is the immediate superior of the teacher; sees that all children of school age attend school; conducts examinations in the Public School and suitable tests of pupils of private schools; selects text books, prepares annual reports on school matters within its jurisdiction, etc.

The teachers have a limited voice, in an advisory capacity, in the administration of school matters—in urban municipalities through the local staff, with the principal as chairman; and in rural municipalities the permanently appointed teachers are given an opportunity to make recommendations in respect of matters that may be submitted to them according to law. These may be questions concerning the course of studies in the individual school, the erection of new school buildings, the re-organization of school districts and establishment of new schools in the district, the allotment of scholarships, the distribution of prizes for assiduity, and the acquisition of books for teachers' and children's lending libraries.

A certain authority in the management of the individual school is vested in its Principal, who has the immediate supervision of the work of the school and of its teachers. To him is also committed the care of the school buildings, and the registration of the pupils. He prepares and periodically submits reports touching upon the work of his school.

COMPULSORY ATTENDANCE.

To insure lawful school attendance, a register is kept in each municipality of all children who have reached school age. A fine is imposed on parents who neglect to promptly report change of residence of such children to or from the school district.

In order to prevent neglect in school attendance, the laws provide certain remedies as against the parents. Those who permit their children to neglect school without lawful cause are fined 3c., 6½c., 13c. and 26c. respectively, for each day during the first, second, third, fourth and succeeding months within any one term. For non-attendance beyond four days in any month an additional fine of 6c. is imposed for each day of non-attendance during the month, though the fine is not to exceed 25c. per day. In default of payment the fines may be enforced by execution and imprisonment.

The fundamental plan of school management in each municipality is drawn up by the local school authorities, subject to the approval of the Department. This plan includes regulations governing the number of schools, the limits of the school districts, the number of teachers and their salaries.

Details as to Public School instruction in the individual municipality are contained in its Course of Studies, which is also planned by the local authorities, subject to the approval of the District Board. The Course of Studies provides among other things for the subjects to be taught to the individual classes or grades of pupils, the standard to be reached in the several subjects by each class or grade, vacations and school holidays, etc.

THE TEACHING STAFF IN THE PUBLIC SCHOOLS.

The Seminaries (Normal Schools) provide for training of teachers, four being State Schools, the 16 others being private seminaries subject to State supervision but entitled to conduct examinations of their own students. The Seminary Course covers three years. The annual tuition fee is \$10.80 in the State Schools, and in the private schools from \$40 to \$65. The former give free tuition to teachers' sons, and up to one-third of the number of the students may enter on half fees. The State makes an annual appropriation of \$32,400 toward Scholarships for needy students at all the schools, distributed in amounts ranging from \$27 to \$50 annually. Seminary students must have had at least one year's practical training in teaching before entrance. An examination (in two parts) completes the seminary training, and qualifies the candidate for appointment as Public School teacher.

Special seminaries, one State seminary giving free tuition, and four private ones, qualify women as teachers in primary schools. These students are also eligible to receive State Scholarships.

QUALIFICATIONS AND APPOINTMENTS.

For permanent appointment as teacher in Public Schools, in addition to graduation, principal teachers must be 25 years of age and have had two years' previous practical work in teaching; others, one year either in private schools or as temporary teacher in Public Schools. All teachers must before appointment show freedom from contagious tuberculosis of lungs and larynx. Teachers who do not belong to the National Church are not eligible to permanent appointment in the Public School. All Principals (head-masters) are appointed by the Government, and all other permanent appointments are made by the District Board (in some isolated cases by the Bishop) on the requisition of the municipal council concerned, who submit the names of three applicants, from whom the Board makes the selection. Substitute teachers may be appointed by the local School Board, subject to the approval of the District Board.

Misconduct on the part of a teacher may be punished either through the Public School administration or courts of law.

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The hours of teaching are normally 36 per week, and not to exceed 42 when rural school teachers give tuition in special subjects. As a rule, the rural teacher instructs in all subjects, while in cities specialist teachers are generally employed.

In cities and towns the Principal directs the work of his school. The larger cities have several Principals, one of whom is School Inspector. At some points the schools are under supervision of a Superintendent of Education, individual schools having permanently appointed male and female teachers and specialists. Country districts have male head teachers, assistant teachers, female teachers and primary school teachers. In addition to those there are temporarily appointed teachers of Infant, Winter and Branch Schools.

SALARIES.

The salaries of teachers are fixed by law. Permanently appointed teachers, male or female, in the towns and cities are paid according to two separate scales. The Department makes the choice between these upon the recommendation of the Council of each municipality, and according to population. The initial lower scale for teachers is \$405, and the higher \$432. Both increase by 4-year periods during 20 years to \$756 and \$810 respectively. The initial salary for female teachers is \$378 and \$405, and the maximum is \$513 and \$540, according to the scale adopted. Head teachers (principals) receive \$810 or \$864, according to scale, increasing in 3-year periods during 12 years to \$1,053 or \$1,134.

The salaries of teachers in country schools are likewise graded, commencing for head and single teachers from \$243 to \$378 and increasing by \$54 every fourth year to \$513 and \$648 respectively. For assistant and female teachers the salaries commence at \$189 to \$243 and increase by \$40.50 periodically to \$459 or \$513 for the former and to \$405 or \$459 for the latter.

The salaries of female primary school teachers commence at \$148 to \$189 and increase by \$27 every third year, up to \$256 or \$297.

The initial salaries are fixed within the foregoing limits by the Department after consultation with the municipal council, with whose consent salaries may be increased beyond the maximum stated.

Salary increases are made on the basis of "years of service" of the individual teacher, according to rules fixed by law.

The head teacher in country districts receives a special honorarium (\$6.75 per class) when there are at least seven classes (grades). The care of school rooms may be assigned to rural teachers by the municipality paying at least \$20.25 annually for each class room.

The teachers in country districts receive, in addition to salaries, the use of a dwelling with garden and fuel. Dwellings for Principals must have three rooms with outside conveniences; assistant teachers must have at least one room. If an urban teacher is furnished with a house, its rental value is deducted from his salary.

RETIREMENTS AND PENSIONS.

Teachers may be discharged either through the courts of law or by the school authorities. The District Board may retire a permanently appointed teacher who applies for discharge without a pension. In all other cases (retirement with pension, or unwillingly with or without pension) the power of discharge lies with the Department.

Male or female teachers who have had permanent appointment in Public School service for 5 years, after having reached the age of 30 years are entitled to a pension if retired through no fault of theirs at the following rates, calculated on the basis of average salary received during the preceding five years:— $\frac{1}{10}$ up to 2 years service; $\frac{2}{10}$ for 2 to 4 years; $\frac{3}{10}$ for 4 to 7 years; $\frac{4}{10}$ for 7 to 10 years; $\frac{1}{2}$ for 10 to 20 years; one-sixtieth added yearly thereafter up to $\frac{2}{3}$ after 29 years.

Widows of teachers, who have the right of pension, receive at the rate of $\frac{1}{8}$ of their late husband's average annual salary for the last five years of his service. Special financial assistance may be granted to the children of a teacher. Every permanently appointed teacher must provide an annuity for his wife, corresponding to $\frac{1}{8}$ of the amount of his salary at any time. In lieu of an annuity he may take out a life insurance policy for fifteen times the amount, payable to her, or he may deposit bonds the interest of which equals the required annuity.

EXPENDITURE IN CONNECTION WITH THE NATIONAL SCHOOL.

(1) The greater proportion of the State grant to schools is expended in the form of salary increases to the teachers. At present this amounts to \$1,080,000. The municipalities pay the initial annual salary of their teachers, and the State pays the periodical increases.

Furthermore, the State pays one half (at present about \$216,000) of the annual pension burden, including all lawful pensions and financial assistance to teachers, their widows and children. The other half is provided by the *School Funds*.

The State contributes to the support of school work in specially needy municipalities.

Finally, grants are made towards the payment of interest and repayment of debentures on school buildings erected under the provisions of the law of March 24, 1899. (These loans have not been available since 1911).

Private schools (Free Schools), both in the cities and in the country, receive annually State grants amounting to about \$29,700 and \$12,150 respectively. Schools preparing pupils for any special examination cannot participate in these grants.

The Evening Schools where the youth receive voluntary instruction from the teachers, often in the class-rooms of the National School, also receive annual grants from the State.

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(2) The "School Funds" exercise a special function in contributing towards the cost of the National School. There are 21 of these Funds, one in each county. They are partly the medium through which the Government grants are paid to the schools, and partly independent treasuries with their own revenues and expenditures. Their revenue is raised by local taxation in the county, and a portion of their expenditure consists in grants to pay salaries of substitute teachers for the permanent staff.

The School Funds are administered by a special board in each county, called "The School Council," made up of the members of the County Council and a certain number of men elected by the municipal councils for a stated period, the presiding officer of the County Council usually being chairman.

(3) All expenditure towards the National School which cannot legally be met by the State or the School Fund rests with the municipality. Under this head comes the cost of school buildings (except in cases of special State grants referred to), school equipment and libraries, and initial yearly salaries to teachers (to which the State adds periodical increases).

The municipality contributes also towards the Evening Schools and the private schools (Free Schools). The funds required for these purposes are raised by municipal taxation.

THE INSTRUCTION IN THE PUBLIC SCHOOL.

All normally developed children are, within certain age limits, required to attend school. Compulsory school attendance commences at the beginning of the first school term after a child has reached the age of 7 years, and as a rule concludes at the end of the second term after he has reached the age of 14. The school year is reckoned as from May 1 to April 30th, and the responsibility for the fulfilment of compulsory school attendance rests with a child's parents, guardians or employers.

The requirement of compulsory school attendance is met normally by enrolment in the Public School, where children whose parents have not the means to provide for their education receive gratuitous instruction. In the Public School as a rule the instruction is free to all children in attendance, but according to law private instruction may also be given either in private schools or in the home on condition that children, who are being educated outside of the Public School, submit to examination twice each year, either in the Public School of the district or in the private school. The examination is conducted by the School Board. If such children fail to attend, without lawful cause, or give evidence of having received insufficient instruction, they are required to attend the Public School. Statistical reports may be required of private schools, but beyond that no public control or supervision is imposed. Anyone can establish a private school. The control lies in the examination.

In cities the Public School is conducted on the same lines as in the rural districts, and the maximum number of pupils in a class is 35. In addition to the Public School, practically all cities have boarding schools with advanced

work, yet these have a number of free places sufficient for children of parents in straitened circumstances to secure gratuitous instruction.

The annual school period in the Public School is 246 days (41 weeks), leaving 119 for vacation, holidays and Sundays. For individual classes in cities the school period is 21 hours weekly, exclusive of Physical Drill, Needlework, Drawing, Manual Training, and Household Science. In rural districts each class must have at least $18 \times 41 = 758$ hours, exclusive of Physical Drill, Needlework, and Manual Training. The Department may make exceptions in this arrangement.

SUBJECTS AND EQUIPMENTS.

The compulsory subjects common to both urban and rural districts are: Danish (an average of at least 287 hours annually in the several grades), Religion, Writing, Arithmetic, History, Geography, Music, Drawing (urban schools only), Physical drill (not compulsory for girls in rural schools), Needlework (in rural districts when employing female teacher).

Instruction may also be given in Nature study, Hygiene, Manual Training, Domestic Science and Physical Drill for girls; and in the higher grade schools, Mathematics and Modern languages. School baths may also be included in the curriculum, both in urban and rural schools. If no gymnasium is available Physical Drill may be given on drill or play grounds, or in the class-rooms with some of the ordinary furniture for equipment. Each class receives 2 to 3 hours weekly, preferably in half-hour periods daily. Organized games and (in summer) swimming may, in a measure, be adopted as a substitute for instruction in Physical Drill. Each school must have adequate playgrounds, and it is recommended that access should also be had to larger grounds for ball games.

Examinations are held in the Public School once or twice each year. Registration of entrance and leaving are made each spring and autumn. The examination of private school pupils is made by the School Board twice each year.

The equipment, books, etc. used exclusively in the Public School are provided by the municipality; books used by pupils both in school and for home study, and those used in home study exclusively, are provided by parents when financially able; if not, the municipality may provide them free of charge when thought necessary.

The Department issues lists of text-books recommended for use in the Public School, and the State makes annual grants towards the establishment and maintenance of Public School lending libraries for use of teachers and pupils.

The Department provides regulations for the selection of school sites, also standard plans and specifications for the erection and interior arrangement of school buildings in rural districts. The district physician is consulted in the selection of the sites and in the arrangement of buildings. The Department also furnishes suggestions with regard to plans for gymnasia.

Regulations, approved by the District Board, are made to provide for sanitary conditions and care of the school buildings, also for use of schools and gymnasia for other than public school purposes, such as religious meetings, evening schools, other public meetings, etc.

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RURAL SCHOOLS.

In rural districts each municipality has one school district (generally more), and each district has either (1) one school with one or more grades for children of all ages, or (2) a central school for the older children, with one or more primary schools for the younger. As a rule the Course of Studies is common for children of both sexes.

The number of teachers required at any school is determined according to the school attendance. If the average attendance of children in any class, for two years in succession, has exceeded 37, it must be brought down to that limit. As one teacher can instruct two classes (grades), the maximum number of pupils in a school with a single teacher is 74; in a school with 2 teachers, 148, etc.

Children up to 10 years of age may attend the Primary School, which, as a rule, is divided into two grades—children of 9 to 10 being in the senior grades, and those under that age in the junior.

In a few sparsely populated and poor districts of the country there are still schools with unexamined, temporarily appointed, low-salaried teachers. These are called Branch Schools, Winter Schools (open during the winter term only) and Kindergartens for children up to 9 years of age. The number of pupils in such a school must not exceed 35.

The school attendance is arranged so that each class (grade) receives instruction either for six half-days or for three whole days each week. This arrangement is generally combined in such a way that the pupils of the senior grade attend oftenest in winter and those of the junior grade most frequently in summer.

The Rural High Schools constitute a special class of the private schools. They are boarding schools, and give instruction to young men and women who have already passed through the Public School. They give instruction in popular and higher branches of learning (the People's High Schools), or in special practical branches (Agricultural, Horticultural or "Husmand" schools). State grants are made to such schools as well as to needy pupils.

SCHOOLS FOR ADVANCED INSTRUCTION.

Of schools giving advanced instruction—the so-called "High Public Schools"—some are State, others Municipal, and still others private schools. They may be divided into two classes: (1) the Secondary School, with four yearly grades, for children 11 to 15 years of age, which may include a further class, the High School (Realskole); and (2) the Collegiate (Gymnasiet) with three yearly grades, for youths of 15 to 18 years of age.

The final examination of the Secondary School which admits to the Collegiate is known as the "preliminary examination." The final examination of the Collegiate is called the "student examination" (artium) and admits to the University.

The Department may, upon certain conditions, empower municipal or private schools to conduct examinations with the same effect as do the higher State public schools, provided they comply with the same requirements as to studies and teachers' qualifications.

The right to conduct a Collegiate examination is conditional upon the staff of teachers having passed a State examination in pedagogy and ability to teach. The examinations at the municipal and private Secondary Schools are partly—as regards certain subjects—State controlled. The daily instruction in the advanced schools is placed under the supervision of two educational experts employed by the Department. One of these is in charge of the higher municipal and private schools (Collegiates), and the other of the municipal and private Secondary and High Schools.

Annual State grants are made to the municipal and private Collegiates, as well as to the Secondary and High Schools outside the limits of Copenhagen.

THE NATIONAL SCHOOL IN COPENHAGEN.

There is considerable difference in the Public School administration in Copenhagen and in other municipalities, the former having more self-government than the others in school matters.

The highest school authority here is a Board consisting of the Chief Magistrate (Over President), one of the Mayors, and one of the Deans of the City. Subordinate to this Board is a Superintendent of Education and two Assistant Superintendents. The immediate supervision of the individual schools rests with the local School Boards. Each school has its Principal and Assistant Principal, besides a permanent staff of regular and specialist teachers.

The school Principals receive as yearly salary \$1080, increasing to \$1404; male teachers receive \$432, increasing to \$972; female teachers \$432, increasing to \$702.

There are two principal groups of municipal schools, viz:—Fee Schools and Free Schools, both for children of school age. The former charge the very moderate fee of 27 cents monthly for each pupil, but this is sufficient to secure the maintenance of a more select class of pupils than is the case in the Free Schools. All schools have 7 grades. Instruction is given to each class for one-half of the day, and two classes of children are taught in each class room daily, one in the forenoon and one in the afternoon. A few municipal schools give advanced instruction in secondary grades for children from 11–15 years of age.

SECTION 3: TECHNICAL INSTRUCTION.

INTRODUCTORY.

Technical Schools were originally begun only as Evening Schools about the middle of last century, so that in all the provincial towns such schools have now been in operation for a long time, and in all the country round new ones are still being established. Though such schools were considered indispensable, their activities for many years remained on a rather primitive level as to financial support and as to method of instruction. However, in exterior conditions these schools have been greatly improved during the last 30 years, chiefly because

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of Government aid, constantly increasing, for the erection of appropriate school buildings, maintenance, etc., as shown by the following amounts granted in 1909-10:—

To the Technical School at Copenhagen.....	\$ 24,570
“ carrying on of schools in Provincial towns..	60,750
“ subjects of general instruction.....	4,050
“ training of teachers.....	10,800
“ assistance of pupils.....	13,500

There are now 145 state-aided Technical Schools in Denmark (excluding Copenhagen), at 91 of which special buildings have been constructed, the Government having contributed one-third of the total building cost, including the price of the land.

During the period from the school year 1889-90 to 1907-08 there has been an increase in the number of pupils from 6,961 to 15,737, and in the hours of instruction from 74,317 to 215,727. In the Technical School of Copenhagen 3,509 pupils were instructed in the year 1907-08.

DUE TO PRIVATE INITIATIVE.

Everywhere the schools are established on private initiative, and are carried on as private schools subventioned by Government. From the beginning the management of the schools was in the hands of the local Mechanics' Associations; but later on, particularly in the cases of the more important ones, it has passed to the so-called Technical Societies, to the boards of which, owing to their financial contributions, one or more members are delegated by the Mechanics' Associations.

The local governing boards, whether Technical Societies or Mechanics' Associations, have in addition to their own contributions received contributions from other local institutions, such as municipal bodies, county treasuries, savings-banks, etc., for carrying on the schools.

Private contributions, including school fees, amounted in the school year 1907-08 to \$83,730, (in 1889-90, \$26,900); in Copenhagen in 1907-08 the amount was \$18,240.

The salaries of the teachers (generally giving lessons by the hour) vary from 14c. to 68c. per hour, 41c. on the average. The teaching staff consists, in a great measure, of teachers employed at public schools, of men expert in technical and artistic science, and of some mechanics.

At the beginning the schools were essentially Evening Schools for mechanics of all kinds, but later on a number of schools, particularly the larger ones, added Day Classes, with instruction specially adapted to builders' workmen, engine-builders and painters. In the Day Schools at Copenhagen, Odense, Aarhus, Randers and Aalborg pupils of the above trades can have the highest technical training for mechanics.

Up to a few years ago only male pupils attended these schools, but now it has become usual for female pupils to attend, the latter being instructed either with the males, or (if their number should be sufficiently large) in separate classes.

SUBJECTS OF INSTRUCTION.

The instruction, usually carried on during the winter months, from October till April, but in a few schools also in April, May and June, comprises the following subjects:

(1) Further instruction in the general elementary subjects (Danish, Arithmetic and Writing);

(2) Drawing, preparatory and professional (under the latter the painting classes);

(3) A number of mathematical and similar subjects, intended to produce technical improvement;

(4) As to a great number of schools, some commercial instruction;

(5) In a number of schools, instruction in one or two foreign languages;

(6) Of recent years, extended instruction of a cultural kind, particularly by means of lectures on subjects from the history of civilization, fine arts, literature or biography.

Everywhere instruction in general school subjects is carried on almost in conformity to the same instruction in the schools for children. The same applies to the other merely theoretical subjects, for which it has been possible from the very beginning to procure a staff of teachers able, as to the matter of teaching, to give instruction equal to that reached in any other kind of schools through many years' practice in teaching the same subjects.

INSTRUCTION IN DRAWING.

As to the instruction in Drawing the condition upon the whole has been quite different. Though from the beginning this has always been the head section of the Technical Schools, there was no instruction in the proper sense of the word, because of the lack of teachers pedagogically trained and of scientific methods of teaching.

Until about 20 years ago there was a merely mechanical copying of drawings, without any instruction attached thereto, so that while a great number of works of very fine appearance were produced, the personal development which ought to have been gained by the pupils was lacking.

During the last 18 years, however, strenuous efforts have been made to render the Drawing instruction thoroughly scientific, especially through Government instruction courses for Drawing Masters. Though the latter plan has been in operation for many years, only since 1890 has the attendance of teachers at work, as well as of candidates, been increasing. In 1890 the number attending was about 50; in the financial year 1908-1909 about 240 teachers and candidates were admitted to the courses, 129 being bursars and 111 receiving the instruction free.

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In the preparatory Drawing instruction particular stress is laid on lectures and examinations, so that Geometrical Drawing and Projection Drawing are becoming, (1) Geometry and, (2) Elementary Descriptive Geometry with Drawing exercises.

In continuation of this plan it is intended gradually to transform the instruction in Professional Drawing so that instead of being a mere production of Drawings from problems already solved, it should consist of professional instruction by means of lectures, together with sketching and examination, and besides this of solving problems rationally placed before the pupils by means of Drawings worked out.

INSPECTION AND GOVERNMENT GRANTS.

An Inspector appointed by the Ministry of the Interior has superintendence of all the Technical Schools outside of Copenhagen. The same Inspector conducts, on behalf of the "Kultusministerium" (i.e. Ministry of Ecclesiastical Affairs and of Public Instruction) the courses for Drawing Masters above mentioned. As these courses (running from 5 to 12 weeks) are generally attended through 4 or 5 years, the Inspector, besides thus superintending the improvement of Drawing Masters, is enabled to watch and guide the work of these teachers in the schools.

Every year all Technical Schools (outside of Copenhagen) subsidized by Government, as well as new schools desiring to share in the yearly distribution of the Government contribution, forward to the Ministry of the Interior a petition containing a short statement of the school work during the last school-year. The Government contribution is then fixed for each school, in proportion to the numbers of pupils and lessons. A part of the total grant is kept out of the calculation to enable the Ministry to give extraordinary contributions to schools whose conditions may render such desirable. The Technical School at Copenhagen receives a fixed yearly contribution from the Government.

SECTION 4: THE PEOPLE'S HIGH SCHOOLS.

To anyone familiar with the names used to classify schools in other countries and not acquainted with the development of education in Denmark the designation "People's High Schools" is apt to be misleading. They represent a movement and institutions that have been called, by eminent Danes who have intimate knowledge, by such names as "Peasants' High Schools", "High Schools of Yeomanry" (H. F. Feilberg), "Popular High Schools" (Alfred Poulsen), "People's High Schools" (Jacob Appel). These schools are Denmark's original contribution to organization, method and practice in education.

HIGH AIMS.

In the large the movement was planned, and the schools are still conducted, for the purpose of, (1) developing a quick sense of responsibility for life, (2) fostering a love of and devotion to Denmark and, (3) cultivating moral, intellectual and practical qualities which enable and move the individual students to do more work for Denmark and to obtain greater satisfactions in life for themselves.

Mr. Jacob Appel, who, when the Commission was in Denmark, was Minister of Church and Education (Kultus Minister), in an address published in 1904, says: "It is an entirely national movement which has caused the development and success of the People's High Schools in this country. I feel convinced that the work of the High Schools has for long strongly influenced the Danish nation and Danish social and intellectual life. Our intention has been and will be in the future to make each single man and women capable of sharing the blessings of social and intellectual life." In the same address he says: "The student of the Danish High School passes no examination, he has no privileges at all. He only goes back again to his work."

In this connection H. F. Feilberg says: "At this revolutionary school, no examination, no certificates, no compulsory attendance at lectures." The movement "was as first looked upon as a fantastic dream of impracticable minds impossible to realize, or, when perhaps realized, producing day-dreamers."

Mr. Alfred Poulsen says: "There must not be advantage gained from frequenting such a school but that which can be neither weighed nor measured, nor on which a pecuniary estimate can be placed. No other profit must be de-



PEOPLE'S HIGH SCHOOL AT ASKOV.

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rived from the instruction than the increase of inner worth which all good learning gives." He quotes in this connection the words of Hughes in "Tom Brown's School Days." When asked: "Why do you send your son to school?" he answers: "If he only can become an honest, useful, truthloving Englishman and a gentleman and a Christian—that is all I wish for." Mr. Poulsen adds: "The man who has said those words, thoroughly understands the aim and object of our Danish High School."

In an address delivered in 1901, Mr. L. B. LaCour, himself one of the foremost leaders, said:

But what object do the schools pursue? The schools are working towards the three great aims of the Danish people during the present age—(1) to foster love of the country and national feeling; (2) to educate the people to make proper use of the free constitution which we obtained peacefully in the year 1849; and (3) to prepare the young so as to give them a better chance in the fight for existence as it is now raging in all trades and not the least in agriculture. To solve this problem it is first of all necessary to develop the personal character, to make of the young true men and women, and this is chiefly and best done by means of free lectures, giving instructive and interesting examples of the history and by a more intimate knowledge of the best of the literature of the nation. As Bishop Grundtvig (the original founder) says in one of his best songs, "It is the best possession of man to know God and himself. Make every man a servant of God and a master of his task." In those few words are contained the double object of school work, namely, universal and professional education.

They were not established to lead straight to better pay, more profits, or better positions as such. They pointed to nothing so definitely as to the hope held out to young men and women of entering upon the joy of life with enthusiasm inspired by the glory of a historical past, by the power of language spoken and sung, by the inspiring uplift of literature, by the beauty in nature and by the dignity and meaning of human life.

THE SUSCEPTIBLE AND ACCESSIBLE AGE.

Young men who attend in winter and young women in summer are admitted not before 18 years of age and seldom after 25. Mr. Alfred Poulsen says: "They are all schools for grown-up people. Grundtvig (who conceived the plan) held to the opinion which experience has shown to be right that it is at the age of 18 to 25 that the intellectual faculties are most accessible to intellectual influence. Before that age the mind is not sufficiently developed, and meditation cannot be awakened. Later on, in more advanced age, most minds will be occupied with the practical duties of life, but the age of strong emotional feelings and arduous longings, 'the sturm-und-drang' period natural to youth, is the best time for sowing the seed of knowledge and for exercising the personal influence of the teacher. For on the latter all depends."

Feilberg says: "In youth the eyes commonly are wide awake. All the gates of the intellectual and emotional nature of man are opened. Youth is the sowing time for the harvest to come. The deep impressions received in youth will stamp a man's mind and will do so for life."

EVOLUTION AND GROWTH.

From time to time there has been a tendency towards and then away from including industrial and agricultural education within the High Schools them-

selves. At first, subjects appropriate for practical education were taken up at some of them. At a later stage a few schools developed two branches which were both kept up at the same institution, namely:

(1) High School with liberal education.

(2) High School with vocational education for farmers, joiners, carpenters, builders, fishermen.

In such a school all the pupils met together daily to take some lectures together. They all lived together. That gave a unity to the life of the school. A few of this type still continue. Then the third stage, in which the schools are just now, presents this situation: about 50 People's High Schools proper; about 30 People's High Schools with a vocational (that is, agricultural, house-keeping or technical) side; about 20 Agricultural Schools; and about 13 House-keeping Schools.

In Denmark it is generally held desirable that young grown-up people, who are to be occupied in agriculture and housekeeping, should begin their later education with a High School course before attending one of the vocational schools. As a matter of fact the majority of the Principals of the Agricultural Schools have themselves been pupils of some High School.

At the beginning of the movement instruction was provided only for young men. Afterwards a course for young women was provided during three months of the summer. A still later development was made in providing through one Extension High School, at Askov, for advanced courses for the further education of some who might become teachers or principals in the High Schools and others. In this course the men and women attend together through the winter months.

At Askov there is also a special course annually for 20 young teachers connected with People's High Schools. The course is one in general subjects (sciences, mathematics, etc.) and continues three months; it is usually taken by a teacher in each of two or three years.

THE DEVELOPMENT OF OTHER SCHOOLS.

The People's High School, as a school for liberal education only, has had a very close connection with the progress of agriculture and the development of technical education. Mr. Alfred Poulsen says: "The Agricultural or Technical Schools or Colleges are closely related to the High Schools. The persons who superintend them are on a friendly footing with the High Schools, and their whole plan is laid out upon the same principles. They work hand in hand with them, receiving not only the majority, but as they say themselves, their best pupils from the High Schools."

It is estimated that about one-half the students at Agricultural Schools have first been pupils at the People's High Schools. On the whole the feeling seems to be rather general against putting "practical," "much scientific," or "agricultural," instruction into those People's High Schools which are not distinctively vocational.

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THE SCHOOLS TRANSFORMED THE NATION.

From 1870 to 1880 agriculture in Denmark underwent a great change. The system of farming, based chiefly on the growing and selling of grain, was failing. The exportation of grain was the chief channel through which the surplus products of agriculture brought revenue to the country. Under the leadership of wise and patriotic men the attention of the rural population was directed to the development of dairy husbandry and more particularly to the production of butter. That was well begun by 1880. It then became evident that if the Danish butter was to obtain a good place and a good price in the English market it must be produced of a better, more uniform and dependable quality. Further, it would be necessary to provide greater quantities, and that continuously throughout the year, in order to maintain a hold upon markets which had been acquired.

Mr. Alfred Poulsen states:

Then arose as by magic the large co-operative dairies, which get their milk from larger districts, ordinarily from a whole parish. By this mode of proceeding it was rendered possible for our butter to gain its good reputation in the English market. The quickness and precision with which this change was carried out, is due partly to the leading agriculturists of our country and partly to the High Schools. By their help a set of young, energetic men were brought up to understand the importance of the new ideas; and to secure the success of the new principle of co-operative manufacture, some of them, after a very short course of instruction, were able to undertake the responsible work as managers of the larger and smaller co-operative dairies. * * * The greater part of the men and women who manufacture this butter are pupils of the High Schools. I might, if time allowed it, quote many sayings of men, who in different branches of industry have made themselves prominent. They all agree in this, that the young people who have frequented the High Schools are much more to be relied upon, more industrious than their comrades who never had the opportunity of attending them. To be brief, I shall content myself with stating a remark recently made at the Congress of Antwerp by Mr. Peschke Koedt, one of our most influential merchants. He said: "The Popular High School is one of the most prominent factors in the economic life of the country."

"HIGHLY DEVELOPED COMMON SENSE."

It is not claimed in Denmark by the most ardent friends of the People's High Schools that an education along the lines of national hero-worship, with poetry and other elements of patriotic delight, must necessarily advance towards good agriculture, good butter-making and good cattle-raising. The belief is that these schools were thoroughly attractive to the peasants and developed the habit of taking in and considering knowledge.

It is common knowledge in Denmark and wherever the methods of Danish agriculture and agricultural commerce are known that (1) in grain and root crops, and live stock and products from live stock, the yields have been increased; (2) qualities have been improved; (3) cost of production has been lessened; and (4) better prices have been obtained. Mr. T. P. Gill of Ireland says the authorities in Denmark generally rely more upon the "highly developed common sense of the Danish farming class as brought out by their High School education, and their system of organization for the spread of improved methods of farming, than they do upon any special technical training in the schools. The intelligence of the Danish farmers is so sharpened and broadened, and they have at hand so efficient an instrument in their system of organization, that they are capable of

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appreciating at once the results of investigations as they come from the universities and laboratories, and are in a position to apply the knowledge thus received. At the same time the greatest care is taken that there shall be no lack of special technical education."

Sir John Gorst, at one time President of the Board of Education of England, has mentioned that the education imparted to the rural population by the People's High Schools and the Agricultural Schools is an essential reason why Denmark has risen from being one of the poorest of European countries to be one of the richest.

PEASANTRY ENLIGHTENED, WEALTH DIFFUSED.

Bjornson's saying is often quoted: "Denmark has the most enlightened peasantry in the world." Perhaps nowhere else does one find the people in general better educated. With education as with wealth, there is a general diffusion which brings the average to a high level without leaving large numbers unhelped. In Great Britain, for example—to which (according to Mulhall) Denmark stands second in average of wealth per head of population—there are a few very rich people, a majority of people of moderate means, and a lamentably large number continually approaching a state of economic distress. On the other hand, in Denmark the well-being is generally diffused. The average wealth of two persons, one of whom owns one million dollars and the other one hundred dollars, cannot be regarded as \$500,050 by any stretch of the imagination by the man who owns only the one hundred dollars.

HOW THE HIGH SCHOOLS ORIGINATED.

At this point it is appropriate to narrate briefly the origin and development of these schools. It appears that the idea of them and the first steps towards carrying the idea into effect were due to Bishop Grundtvig (1783-1872) a famous Danish poet and historian. "If great genius for one thing is known by its power of uniting and combining together, then Grundtvig undoubtedly is our greatest man. He is in a word the national hero of ours." (Poulsen). He was characterized and moved by human sympathy to work for his fellow man. This feeling showed its influence especially in his love for the uncultured, unartificial man. Like Carlyle, he venerated the common sense of the farmer and the horny hand of the labourer.

In a letter written in 1841 to King Christian VIII, Grundtvig developed part of his idea, saying that,—

Among the teachers of the High School there ought to be at least one who was "a master of the mother tongue, not only as it is found in books, but as it lives in the nation; at least one who knew and loved our fatherland's history and was able to picture it vividly in words; at least one who knew and loved our national songs in their old form, as well as in the new, and was able to lead the choir himself or have an assistant to do it; at least one who had seen much of our fatherland and knew the nation, the trades and the resources; and, finally, one learned in the law was to be desired, one who could give the youth a true and living apprehension of our fatherland's constitution and laws, formerly and now."

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After him came Kristen Kold. The following is what Mr. Ludvig Schroder, of Askov, stated regarding the precise nature of Kristen Kold's contribution to the success of the High School movement:—

Kristen Kold contributed more than anyone else to prepare the way for the influences of the High School in the large broad strata of the population. He also set the example of making the life at school as home-like as possible for the young people who were brought together there. Finally, it is he who, having engaged women teachers in his school, began to collect young women as pupils in the summer, while the winter was given up to the young men. Grundtvig sketched the plan, but Kold laid the foundation securely and well by showing that the schools must first try to enliven the youth, and after that to enlighten them.

THE SCHOOLS DEVELOPED THE PEOPLE.

The first school was founded in 1845, four years before the era of the present constitutional government; but the movement took a new sweep and pace after the disastrous war with Prussia, and the loss of a large part of territory, in 1864. The work of the first leaders has since been carried forward, amplified and evidently improved, by bands of noble men and women, chiefly of peasant or small yeoman origin, who have inherited the vision of the great leaders and have maintained their enthusiasm joined with faith in a great future for Denmark and an abiding faith in the providence and wisdom of God.

The development of Denmark gave a peculiarly appropriate setting for the work which these schools have undertaken and done so well. Rather less than a century and a quarter ago the Danes were serfs. The boon of self-government was gained in 1849 without bloodshed. Their history from the beginning of the century had been one of severe national disasters and partial recoveries. When the climax to the impairment of their size and power came with the loss of the southern provinces, after the war with Germany in 1864, the people were disheartened to such an extent that their leaders feared they might wholly lose faith in the future. Resolution to avert the threatened evil and remedy the condition was the impelling motive of those in sympathy with the aspirations of Grundtvig.

THE PEOPLE DEVELOPED THE SCHOOLS.

Under the leadership of the men who have been chiefly responsible for the People's High Schools, private initiative has played an ample part in the progress of the country. An outstanding characteristic of the Danes from the time of the old Vikings has been a spirit of selfreliant independence. Since they gained self-government they have been characterized by the keenness with which they seek after knowledge. The nation, through the personality of its people, gives one the impression that it hungers and thirsts after intelligence. Out of such conditions and material the educational and co-operative movements have grown. Each of them has had its part in making Denmark intelligent, capable and rich. One does not find supine contentment. Perhaps that might be to such a people a weed rather than an enriching crop.

Before the war of 1864 there were only 20 High Schools in Denmark, but in the few years, 1865-70, 50 new People's High Schools had entered upon their work.

At the present time there are about 50 People's High Schools proper, about 30 with an Agricultural side, about 20 Agricultural Schools, and 13 Housekeeping Schools, all similar in plan of organization and maintenance. The first two kinds are attended by about 7,000 pupils annually, in about equal numbers of young men and young women, and the third kind by about 2,000 students. The 5 largest People's High Schools were attended in 1906 by more than one quarter of the whole number, whereas the 38 smallest ones had not more than another quarter.

The Agricultural High Schools grew out of the People's High School movement first as a branch on the parent stem, and afterwards as separate institutions, following similar methods but having agriculture and the related sciences as the main portion of the subject matter. The Agricultural Schools are located generally in the neighbourhood of a People's High School. In some cases teachers lecture in both schools.

At the People's High School the course for men occupies only five or six months of one winter, and the course for young women only three months of one summer. The courses at the Agricultural Schools occupy about the same time. Allowing for those who attend an Agricultural School after attending a People's High School and those who attend twice, about one person in every five who annually come to the age of 18 years in the rural population attends a People's High School (liberal, agricultural or housekeeping). The proportion has been steadily increasing. After the young people go through the comparatively short course, as a rule they return to their homes and to farming work. It is estimated that there are at the present time in Denmark nearly 150,000 men and women who have attended these High Schools. Mr. Thornton says that when the Parliament assembled in 1901 it was found that 30 per cent of the members of the Upper and Lower Houses had been High School pupils.

The High School pupils exert a marked influence on the social and intellectual life of the people by the spirit of comradeship and friendship which is maintained after their attendance at the High School ceases. Scattered throughout Denmark in 30 or 40 different towns, "High School Homes" have been established and maintained. These are in the nature of simple hotels, with plain living accommodation, a few rooms for meetings, useful libraries, etc. When ex-students of High Schools have occasion to visit the towns they make these High School Homes their headquarters.

COURSES OF STUDY OR WORK.

History takes the most important place among the subjects, and particular stress or emphasis is laid upon Danish (the mother-tongue), and Literature. A good many lectures are given on Geography, Physics, Anatomy and Hygiene. Some time is devoted to Arithmetic, Drawing, and in some cases Surveying.

Physical Culture is regarded highly, and receives much attention. The schools maintain that rational bodily exercise is of the utmost importance for the health and vigour of the body, for the capacity to do mental work, and for

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the strengthening of moral qualities. The regular daily gymnastics are considered of not less importance for students who come from hard bodily exercise than for those engaged in sedentary occupations.

Singing is more than a subject, a course, or an art; it becomes an atmosphere, a feeling and interest, which embraces all others. It is inseparable from High School teaching. The pupils sing one or two songs before the commencement of every lecture, and very often afterwards. When it is remembered that there are three to five lectures a day besides the other educational work, it becomes evident that the remarkably rich collection of historical, national and vernacular songs and hymns which the Danes possess is put to a generous use.

In brief, the work at the school, as gathered from observation by the Commission and discussion with the teachers and others, is characterized chiefly by the attention given (1) to History, the Mother-tongue, and Literature; (2) to Physical Culture and Singing; and (3) to other subjects, including some sciences and practical work. Many of the teachers and others are opposed to the extension of practical work in the High Schools proper.

THE SPIRIT AND METHOD.

The Danish teachers state that no one is able to judge of the course by an inspection of the time-table and the different subjects mentioned on it. The claim is made that the importance and emphasis should be laid upon *how* information is imparted and education given, and upon *who* it is that gives it, rather than upon *what* is the subject matter. "The mark to be aimed at is not to learn this or that, much or little, but to be made prepared for the teaching of life." The wife of the Principal, in her relation to and influence upon the students, is one of the powerful factors.

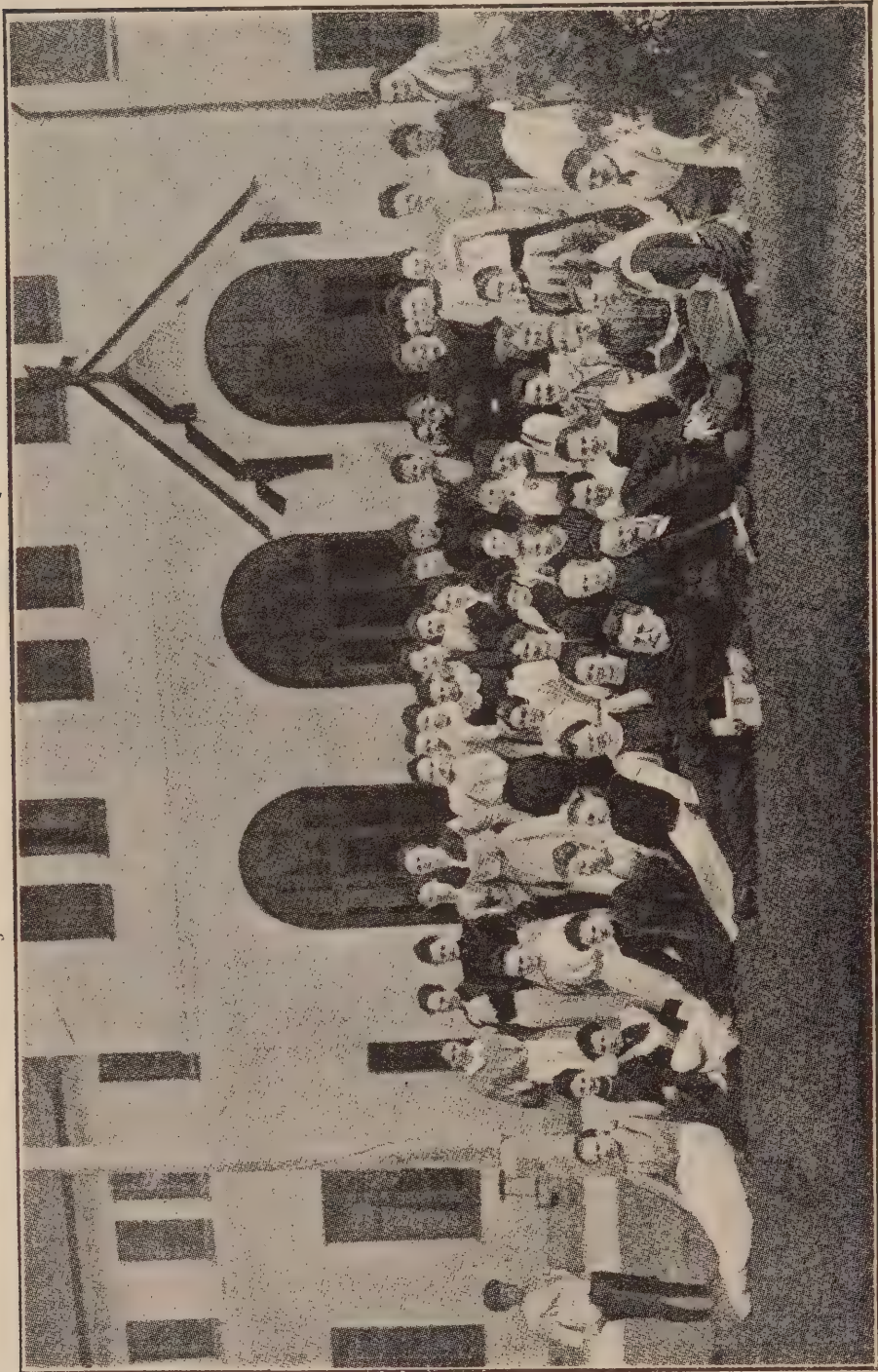
The lecture method is the one chiefly employed. Books play a very subordinate part in the work of the school, although pupils acquire a love for reading and ability to use books which influence and enable them to go further after they have left school. In the teaching of History a great deal is made of the characters of the men and women who stand out as having originated, shaped or directed the conspicuous movements in national or world affairs in the past. In all the High Schools one sees portraits or busts of the great men and women of Denmark who are renowned for services rendered to the nation. Some leaders now want to modify the course in History by including British and American history and economics, as these have come to play such an important part in the life and outlook of the Danish nation at the present time.

In 1910 Holger Begtrup, who is regarded as one of the ablest High School men in Denmark, said: "It is the special business of the High School to show with clear emphasis how we, through union with England and America, are helped in our journey to that higher human development our race is striving after."

ATTENTION AT LECTURES.

The use of notebooks by the students while the teacher is lecturing is discouraged. The object is to have the pupils come under the sway of the lecturer.

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SUMMER STUDENTS OF THE PEOPLE'S HIGH SCHOOL, LYNGBY.

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turer, in order to be impressed by the main ideas of his discourse, rather than to have them retain a distinct and clear recollection of the data or facts which he may have stated. "On that very point where the ability of the teacher meets the wants of the pupils, there exactly lies the task of the school."

Experience does not show that every lecturer can hold the attention of all or even of a majority of the pupils on all subjects when no notetaking is encouraged and no examination is expected. One member of the Commission in observing a large class of women, during a lecture on a science subject, estimated that not more than one-third of the class were paying reasonable attention to the subject of the discourse.

SOCIAL QUALITIES DEVELOPED.

The students dine together. In the dining rooms visited the appointments were of the simplest sort. In some of them table-cloths were used, in others there was a table-cloth only at the table of the Principal, with oilcloth covers on the others. The seats were long benches without backs. The good-fellowship which prevailed was in itself an evidence and means of further education. At the close of the meal one heard everywhere the salutation, offered by neighbour to neighbour and promiscuously as the room was being left, "Velbekomme" (May it do you good). On all hands there was plenty of good humour and evidence of genial comradeship among the students and between the students and teachers.

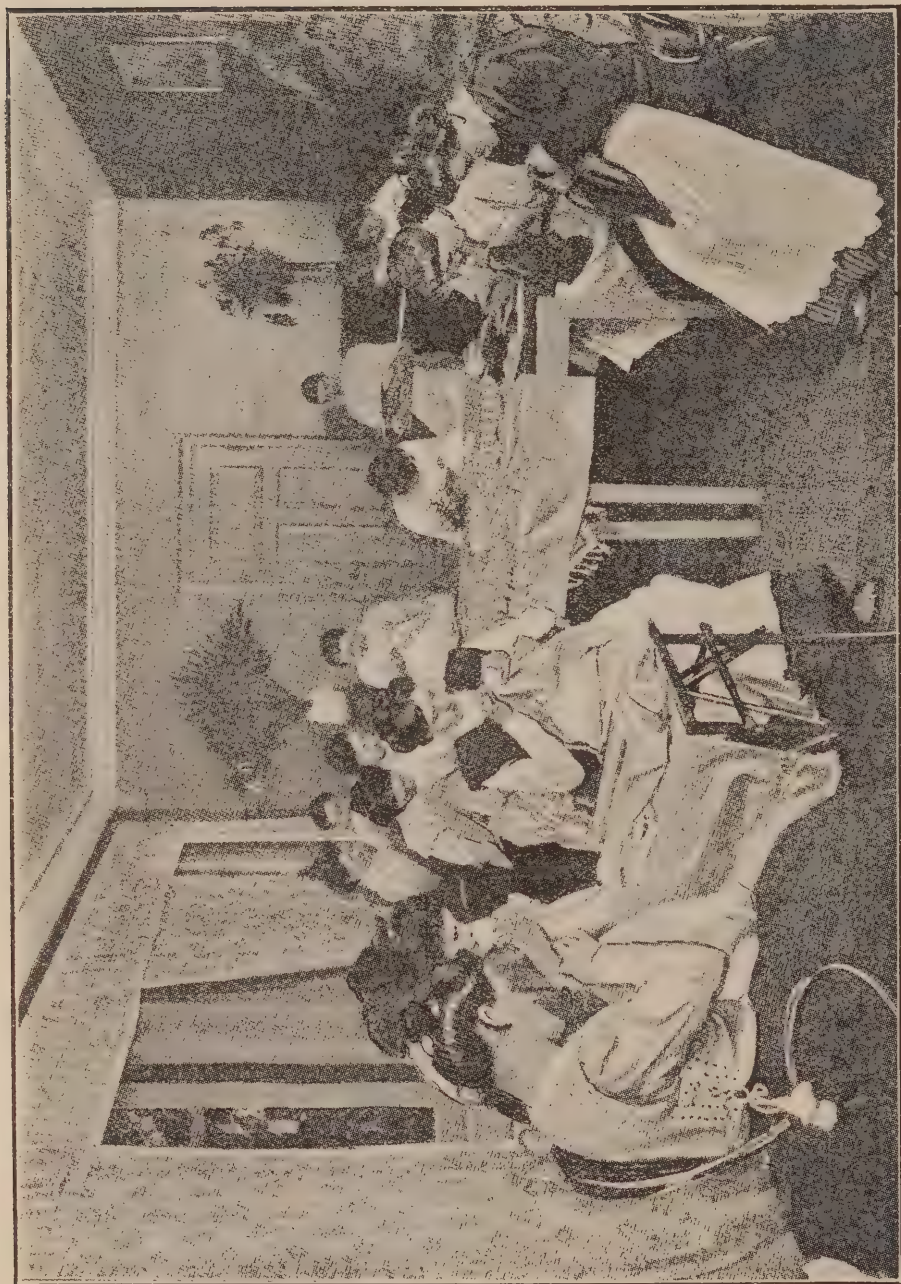
The features that stand out boldly as the results of the school are the awakened interest in the meaning of history and literature, the culture and friendships which come from living and studying together for a period of three or five months as the case may be, and the subtle, strong and evidently enduring influence of singing historical, national and patriotic songs and hymns together.

HOW THE SCHOOLS ARE FINANCED.

The People's High School is really a private institution receiving some assistance from the State. They were all founded by private means and, with some exceptions, are owned by the Principal of the school. In a few instances hundreds of the peasants (small landed proprietors), feeling the need of the school, voluntarily subscribed towards the cost of its establishment. To entitle the school to receive a grant from the State it must have been attended by at least 10 pupils for two years, and conducted in a satisfactory manner. The means whereby the latter fact is established was not made clear.

Besides the amounts which are provided by the State as Scholarships for the poorer students, grants-in-aid or subsidies are paid by the State to the Principals and owners of the Schools in the following way: A grant of 500 Kroner* is given every year to each school; 10 Kroner is paid to the Principal every year for each student in attendance. Besides there is a grant calculated upon the expenses of the school, so far as salaries, books, apparatus and interest

*A Kroner may be taken as the equivalent of 27 cents.



SEWING CLASS AT HASLEV.



HOUSEKEEPING SCHOOL—HASLEV.

upon investment are concerned; but no High School proper can receive more than 3,000 Kroner a year.

It is not likely that these High Schools could have succeeded but for their inexpensive character. They are organized, appointed and equipped in the very simplest way. They are residential schools where the pupils all live together. Each student brings to the school the bedding required and some other small articles necessary. The total fees will average about 30 Kroner (about \$8) per month, including board and residence. The total outlay of the student, including expense of travel, books, etc., would be between \$50 and \$65 for the five months course. The fees vary somewhat and are slightly higher (47 to 27 Kroner per month) at some Agricultural Schools.

MANY SCHOLARSHIPS ARE PROVIDED.

The State co-operating with County Councils provides a sum to be expended yearly in Scholarships for the poorer students. These Scholarships are distributed among the Counties on the basis of the number of students of the previous year. Each subsidised pupil may receive a Scholarship up to 20 Kroner per month of attendance.

In order to obtain a Scholarship a candidate must fill up a schedule in which he makes a statement as to his means (which the parish council must attest), showing whether he or she has had a Scholarship before, and giving particulars of the expenses at the High School he or she proposes to attend. If he wishes to go to an Agricultural School, he must give evidence that his general education is sufficient to allow him to follow the instruction. Where there are more candidates than Scholarships the County Council may give preference to the older candidates. Of all the pupils in attendance at the High Schools, Agricultural Schools and Housekeeping Schools, probably one-half receive Scholarships. No difference is discernible, if it ever exists beyond the inner consciousness of the persons who have received the Scholarships, between those who attend with that help and those who come on their own or their parents' or guardians' resources. Application for or acceptance of a Scholarship is not regarded as anything to be ashamed of. As one Dane has said: "Misfortune lies in poverty only when accompanied by ignorance, immorality and impiety." In the case of the subsidised students, the Scholarship will, as a rule, pay about one-half of the total cost.

The reported attendance of young women at four High Schools proper visited was: Askov, 125; Haslev, 150; Ryslinge, 206; Vallekilde, 275.

In the case of an inquiry in 1907, 17 per cent of the pupils had formerly attended a High School; in most cases the student who takes a second course attends a different High School from the first one attended. There is no second year course, as such, following the first year course, with the exception of the course at the Extension or Advanced School, at Askov. There are special courses in several of the Schools, as for example at Ryslinge for Teachers of Physical Culture, 5 months for men in winter and 3 months for women in summer.

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THE UPLIFT OF RURAL LIFE.

The People's High Schools have become the centres of wide and far reaching influence outside the immediate education in their own courses. In close proximity to most of the largest High Schools proper there are an Agricultural School and a Housekeeping School. The People's High School, at Askov, may be taken as representing the largest development in this respect. Close by it is a Weaving School for girls; and a Sloyd (or Swedish Manual Training) school for teachers. Then there is an Agricultural Demonstration Station just a stone's throw distant; in the vicinity an Agricultural School; and at a distance of two or three miles a School for Housekeeping Occupations.

One feature which must not be overlooked is the influence on the solidarity of feeling in the nation as a whole through students coming from one district to attend the People's High School located in another district. That is quite general.

The Chairman of the Commission travelled a good deal in Denmark, visited farms and conversed with farmers of different types from the husmand, farming three acres, up to the President of one of the Farmers' Associations who farmed three thousand acres of his own property. Typical of the attitude of the others towards the People's High Schools were Mr. and Mrs. Neilson on a 70 acre farm near Odense. They had both been students of a People's High School. The home and its surroundings gave every evidence of comfort, intelligence and refinement. The farm had the appearance of being managed by a working farmer who had adequate practical knowledge and ability. When Mrs. Neilson was asked whether she regarded her course at the People's High School as having been of value to her, she answered: "Yes, certainly yes, it gave a meaning to life for me." Her husband said the same thing in other words. When asked further as to what particular subjects, or part of the course, they now recognized as having been most beneficial to them, they agreed in putting History, Physical Culture and Singing among those which they regarded most highly. They were representative of many others whose intelligence, gentleness, vigorous ability and most courteous good-will are helping to make the nation prosperous and happy.

THE PEOPLE'S HIGH SCHOOL AT RYSLINGE.

Mr. and Mrs. Alfred Poulsen's school may be taken as typical of the best and largest of the High Schools proper. The ground covered is indicated, and only indicated, by the subjects and the time devoted to each.

WINTER COURSE FOR YOUNG MEN (5 months.)

<i>Subjects.</i>	<i>Time.</i>
Danish and Composition.....	6 hours weekly.
Danish History.....	6 " "
Universal History.....	6 " "
Social Science.....	1 " "
Danish Literature.....	2 " "
Arithmetic.....	3 " "

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Geography.....	3	hours weekly.
Nature Science.....	4	" "
Drawing and Surveying.....	2	" "
Agricultural Conditions.....	1	" "
Physical Culture.....	6	" "
Writing.....	about 24	" in all.
Book-Keeping.....	about 24	" in all.
Reading and Singing.....		in the evenings.

SUMMER COURSE FOR YOUNG WOMEN (3 months.)

<i>Subjects.</i>		<i>Time.</i>
Danish and Composition.....	6	hours weekly.
Danish History.....	6	" "
Universal History.....	6	" "
Danish Literature.....	2	" "
Arithmetic.....	3	" "
Geography.....	3	" "
Nature Science.....	4	" "
Handwork (Sewing, etc.).....	9	" "
Physical Culture.....	6	" "
Singing.....	2	" "
Writing.....	about 24	" in all.
Reading aloud		

THE PEOPLE'S HIGH SCHOOL AT VALLEKILDE.

This represents the type which includes the industrial vocational. Mr. Valdemar Bennike made the following statement to a company of English visitors in 1909.

The students are of all ages over 18 years, most of them between 20 and 25, and come from all parts of the country and all classes of society, though the majority belong to the class of small freeholders and cottars, which is so numerous in our country.

Now I should like to give you the picture of a single day here in the winter months, when we have from 190 to 200 young men under our care from the beginning of November to the end of March.

The bell rings them up at 7 o'clock in the morning. They then dress, make their beds, sweep out their rooms, wash, and at 7.30 are ready for a cup of coffee and a bun.

At a quarter to eight the principal (Mr. Paul Hansen) has morning prayers with his household; there also are to be found most of the students, though attendance is not compulsory.

At eight o'clock, four mornings in the week, I give a lecture on geography, and thereby I try to show the audience what relation there is between man and the earth, and how far the people in the various countries have succeeded in reducing the soil to subjection. A song suited to the theme is sung before and after all lectures. On the two other mornings our Free Kirk clergyman lectures on Church history.

Breakfast comes at 9.15 and consists of a couple of sandwiches and a glass of home-brewed ale.

At half past nine the artisans go to a special department in a house a few minutes' walk from here, where they are taught what belongs to their various trades; carpenters in one room, bricklayers in another, painters in a third, and so on. Most of their time there is taken up in learning to execute working drawings. Likewise the fishermen go to their special department, where they are taught navigation and all the natural history of fishes and other water-animals, sea-plants, etc.

The farm-lads stay here in the central building and are divided into four classes held in various rooms; and for two hours practise writing and drawing. From twelve to one the principal gives a lecture on the history of Denmark, the political history as well as the history of civilization, dwelling more especially on the lives of noted men and women of the last century, whose work we are continuing.

At half-past one comes dinner in the large room below.

At half-past two the artisans and the fishermen go to their own departments again until six o'clock. The farm-lads in the meantime are taught accounts and arithmetic for an hour in two classes. At half-past three these last have gymnastics according to Ling's system.

At five various teachers lecture to the farm-lads only, on physics, on the geography of Denmark, on hygiene, and on the history of the world.

At six supper is taken.

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From 7.30 to 8.30 lectures for the whole school are given on the history of Danish literature by Mr. Hansen, and on various subjects by the other teachers, Mrs. Hansen twice a week reading aloud from the best of our poets, and I once a week showing lantern slides or glass photographs from all parts of the world, and explaining them to the pupils.

From 8.30 to 9.30 the artisans and fishermen have their gymnastics while the others have leisure time for the rest of the evening. But you will understand there is not much leisure time for any of them; what there is is used for writing letters, reading, conversing, playing or short walks.

At 10.30 the electric light is put out in the schoolrooms.

Since Vallekilde School was begun by the late Ernest Trier, in 1865, it has had 11,416 pupils—6,391 men and 5,025 women.

THE PEOPLE'S HIGH SCHOOL AT ASKOV.

The timetables of the High School at Askov are illustrative of those of other schools, although there is wide variation in their arrangement at different schools.

SUMMER COURSE FOR YOUNG WOMEN (3 MONTHS).

Hour.	Monday	Tuesday.	Wednesday	Thursday.	Friday	Saturday.
8-9.	Social Science.		Geography.		Nature History.	
9-10.	Physical Culture.					
10-11.	Danish.	Arith.	Danish.	Arith.	Danish.	Arith.
11-12.	History of Literature.			Universal History.		

Dinner.

1.30-2.30.	a. Drawing. b. Handwork.	Handwork. Drawing.	Drawing. Handwork.	Handwork. Drawing.	Drawing. Handwork.	Handwork. Drawing.
2.30-3.	Singing.					
3.15-4.15	Reading.	Hygiene.	Reading.	Hygiene.	Reading.	Danish.
4.30-5.45.	Handwork.					
6-7.	Lecture.					

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WINTER COURSES FOR YOUNG MEN AND YOUNG WOMEN IN THE ADVANCED
OR EXTENSION SCHOOL.

(6 Months Each).

FIRST WINTER.

Hour.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
8-9.....	History of Language.		Mathematics.		Hygiene.	
9-10.....	Physical Culture.					
10.30-11.30	Natural History.		Universal History.		Natural History.	
11.30-12.30	Discussion on Norse History.	Discussion on Physics.	Geography.		Arithmetic.	
12.30-2....	Drawing.					Discussion on Mathematics.

Dinner.

3.15-3.45..	Singing.					
4-5.....	Social Science.		English. German.	Lecture.		English. German.
5-6.....	Danish.	Danish.	Discussion on Universal History.	Danish.	Discussion on Universal History.	Danish.
6-7.....	History of Literature.			Norse History.		

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SECOND WINTER.

Hour.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
8-9.....	Applied Mathematics.		Geography.		Universal History.	
9-10.....	Physical Culture.					
10.30-11.30	Natural History.		Universal History.		Natural History.	
11.30-12.30	Algebra.	English. German.	Algebra.		Discussion on Universal History.	English. German.
12.30-2....	Drawing and Laboratory Practice.					
Dinner.						
3.15-3-45..	Singing.					
4-5.....	History of Religion.		Social Science.		Biology.	
5-6.....	Reading Room.		Discussion on Norse History	Danish.		
6-7.....	Literature.			Norse History.		

SECTION 5: THE AGRICULTURAL SCHOOLS.

The Agricultural Schools have grown up out of the efforts of the farmers and their leaders to instruct and train young men for following farm life without subjecting them to influences from surroundings, instruction or occupations which would be likely to wean them from country life.

They are all residential schools; the pupils live together in a manner similar to that which has been described at length under the People's High Schools. In addition to the class rooms, and a small museum stocked with specimens useful for illustration and demonstration, the Agricultural School has a farm connected with it as part of its equipment.

The farm is not managed or run as an experimental station, and only to a very small extent does it use illustration plots. An illustration is given of the management of the farm as a whole according to the system and methods

which yield the best results in the locality. The Principal is also the managing farmer. The preservation and increase of fertility, and the quantity, quality and suitability of the crops for market and for consumption, are considered. The numbers and the kinds of live stock are determined by the capacity of the farm as directed towards making profits. Since the institution receives a comparatively small grant from the State, it must be managed as a profit-making establishment, or at least in such a way as to make ends meet after paying salaries and providing for the upkeep.

At several places Agricultural Demonstration Stations, which are subsidized by the State and are not connected with the Agricultural Schools, offer additional opportunities for the students to observe the nature and progress of experiments. These are mainly directed towards the illustration of methods whereby the scientific knowledge and principles, that have been proven of value, are applied to land, crops and live stock for profits.

The Agricultural Schools generally are located each close to one of the People's High Schools, and in some cases some of the teachers lecture in both schools.

Like the High Schools, they are private enterprises receiving a small subsidy from the State, varying from about \$1,500 per annum downwards according to size and public service rendered. The combined subvention received by each Agricultural School from the State and the Local Authority averages about \$1,000 per annum.

The State grants Scholarships to assist needy students. The conditions are similar to if not quite identical with those which obtain in the case of Scholarships for the People's High Schools. Scholarships are from 100 Kroner to 150 Kroner per student and cover about one-half of the expense including travelling, books, etc.

STUDENTS AND COURSES.

The Agricultural School, which at first grew as a branch from the High School stem, follows the High School methods, but has agriculture and the related sciences as the main portion of its subject matter. Students pass no examination for admission and receive no certificate at the end of the course.

After leaving the elementary school at 14 years of age, the boys return to their homes for a few years; then, after 18, they go for one or two winters to People's High Schools to continue their education. They then return to farming, or first take a course at an Agricultural School. The popularity of these Agricultural Schools and the proof that they meet a felt want among the people, is made clear by the fact that each winter they are attended by about 2,000 pupils.

Students are admitted from 18 to 25 years of age. They all come with a practical knowledge of farming operations and of farm work and management. The instruction is theoretical, the aim being to leave the students with clear ideas of the application of the principles of agricultural science to farm work and management. An effort is also made, by lectures and otherwise, to let them

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acquire such an understanding of their work that they will like it better and have an intelligent appreciation of its relation to the progress and prosperity of the community.

The ordinary course continues five or six months. At some of the schools a number of the pupils continue three months longer for special studies of plants and matters suited to the work of the summer months. To this extent it may be said that two courses are provided—one of five or six months from November to May and a fuller and more extended course continuing during May, June and July. August, September and October are vacation months alike for the People's High Schools and the Agricultural Schools.

GYMNASTICS BY SWEDISH METHOD.

All the Agricultural Schools have Gymnasiums of large size for the number of pupils. Here, as in the People's High Schools, the system of gymnastics followed is the Swedish, which lends itself to the training of the students without much apparatus.

The method of this gymnastic is very simple. It uses very little apparatus, and may even be carried on without any whatever. All it requires is a large open floor or a hard clay court. Bars and ladders and wooden horses are used where available, but they are not essential. The system is primarily a scheme for general bodily exercise prompted by individual will power. It seeks to cultivate the will through the greater control of the body. It is, indeed, a system of carefully thought out organic education. Like all true sense culture, it belongs more properly under the head of mental culture than under the head of what is commonly meant by physical culture. Notice some of its fundamental principles. It dispenses with music, because the rhythm then becomes the guiding factor in place of the human will. It dispenses with all action on the part of the instructor during the class movement, for this would substitute imitation for the directing power of the will. Both of these provisions are very subtle, and they do accomplish their purpose. The movement is explained and illustrated by the instructor, and each child knows perfectly what is to be done. But he must do it himself of his own volition and quite unaided by music or model. All commands are short and clear, so that they may reach the intelligence with the utmost directness and speed. The response must be equally quick and direct. The first command—"Attention!" asks that the faculties be alert and ready to act, and the body in a suitable position of vantage. The second command names the part of the body to be called into action. The third command tells the direction of motion. The last command describes the motion and calls for it. Thus: "Attention—right leg—upward—bend!" Each word is spoken quickly and distinctly. The exercise is not only meant to develop the body through the muscular exertion required, but still more to develop the power of command. The exercises are all light, and the majority of them would scarcely bring fatigue if persisted in for considerable periods of time. But where the system is well carried out, and the commands follow one another in fairly rapid succession, mental fatigue comes before muscular fatigue, and indicates very positively where the work is being done. The whole purpose of the Swedish drill is to increase the health of the body, to make it alert, quick, usable; above all, to put it under the absolute control of the will. (From "Education and the Larger Life," by C. Hanford Henderson; Houghton Mifflin Company, Boston, Mass.)

THE LADELUNDE AGRICULTURAL SCHOOL.

This school in the vicinity of the People's High School at Askov may be taken as a type of the best and largest Agricultural Schools. It was established in 1879. The school farm contains 80 acres. The institution is owned and managed by the Principal or Director. It has extensive laboratories where much work is done in the analysis of feeding stuffs and artificial fertilizers. That is done under arrangement with Agricultural and Co-operative Societies.

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The Agricultural Course continues 5 months. It is attended by about 100 students.

There are four other courses:—

For Creamery Buttermakers, 5 months (Nov. to March);

For Testers for Dairy Record Associations, 6 months (Nov. to April);

For Creamery Buttermakers, 4 months (April to July);

For “ “ “ in testing milk and cream, (September).

The Agricultural Course of 5 months includes subjects as follows:—

<i>Subject.</i>	<i>Time.</i>
Agriculture (including soils, plant cultivation, rotation of crops, manuring, plant diseases, etc.)	150 hours.
Management of live stock (including poultry)	180 “
Danish	60 “
Arithmetic	60 “
Book-keeping	30 “
Drawing	20 “
Chemistry	70 “
Physics	70 “
Botany	10 “
Geology	8 “
Bacteriology	15 “
Agricultural History	15 “
National Economy	12 “
Surveying	20 “
Dairy Work	12 “
Machinery and Implements	18 “
Physical Culture	1 hour daily.

The fees for tuition, board and residence are as follows:—

1st month, 47 Kroner; 2nd month, 42; 3rd month, 37; 4th month, 32; 5th month, 27.

The total fees for the 5 months' Course are equivalent to \$48.

THE AGRICULTURAL SCHOOL AT LYNGBY.

This school is managed on the same general plan as the Ladelunde School. A farm of 15 acres belongs to the school. Close by it are a People's High School, and an Experimental Station. In the vicinity is a remarkable museum which represents the externals of the progress of Danish peasant life from the rude conditions of one thousand years ago. A series of buildings resemble those of many centuries, with utensils, tools, implements and weapons of the periods themselves.

In another building there is a permanent exhibition of modern agricultural implements, to which manufacturers and agents send machines, implements and apparatus, with particulars of prices. The exhibits must be left for one year at least, at the end of which time they may be left, taken away altogether, or replaced by newer or other articles.

The School is attended by about 120 students. The students who take the 9 months' Course are in a separate class from those who take the 6 months' Course. They take a few subjects together.

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THE AGRICULTURAL SCHOOL AT DALUM.

The school was founded in 1886. It is private property, owned by the Director, but established by the financial aid of a great number of farmers, chiefly small proprietors, from the whole island, who felt the need of such a school. The State and Local Council grant yearly subsidies in furtherance of its work. All the pupils are boarded and lodged at the school. It has two chief Courses annually, one in Agriculture and one in Dairying, besides occasional short Courses for special purposes. The pupils come from all parts of the country.

1. *Agricultural Course.* This Course extends over six months (November to April). There are about 140 pupils, mainly the sons of small proprietors, their ages varying from 18 to 35 years, the average being 23 years. Nearly all are pupils from the elementary schools, but the majority have spent five months at a High School before coming to Dalum.

For such subjects as Arithmetic, Drawing and Land-Surveying the pupils are divided into two or three classes, according to ability. All the other subjects are taught in common by means of daily lectures and frequent oral discussions for which the pupils prepare themselves by means of text-books. There is no terminal examination and no leaving certificate.

The chief subjects taught are: (1) physics, chemistry (soils and their treatment); (2) anatomy and physiology of animals; (3) botany (including plant pathology), the cultivated plants and their culture; (4) tending and feeding of stock; (5) dairying; and (6) agricultural book-keeping. Besides these subjects, series of lectures (without examination) are given in political economy, the history of agriculture, and general history. The school day extends over seven to eight hours; 3-4, lectures; 1-2, discussions; 1, gymnastics; 2, land-surveying, arithmetic, etc. The State grant is \$792 a year, the subsidies from the County Councils of Fyen amount to \$288. Some of the poorer pupils get about \$36.40 (about half the expense incurred) from a Government grant distributed by the County School Boards. The cost of the course, including instruction, board, lodging, and the necessary books, amounts to about \$13.20 per month.

2. *Dairying Course.* This course extends over a period of four months (April-July). There are about 25 pupils, of an average age of 22 years, who have been working from 3 to 8 years in butter and cheese factories. Their previous education is similar to that of the winter pupils, and the mode of teaching is similar to that in the winter course. Besides arithmetic and writing the following subjects are taught:—

Physics (including mechanics and engineering chemistry); botany (including elementary bacteriology); anatomy and physiology of animals and their tending and feeding; dairying (history and general theory); practical instruction is given in milk-testing (Fjord and Gerber systems), in general book-keeping and differential reckoning (Fjord system) for the paying of the milk according to the cream percentage.

A special subsidy of \$528 a year is given by the Government for the dairying course. In connection with the school a model dairy is maintained, to which the Government contributes \$264 a year. The poorer pupils obtain grants of

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about \$28.80 each through the local authorities, the total cost of the course amounting to about \$50.80. Besides these two main courses the day school occasionally gives short courses (1-4 weeks in duration) for crofters and small farmers in milking, testing of milk, and the working of small farms.

3. *The Farm.* The farm attached to the school is run on business principles and for profit, in such a way as to serve as an example to ordinary farmers. The pupils are made acquainted with the whole book-keeping of the farm, and are allowed to examine the stock and general work, but no practical farm work is directly taught in the school. The farm is 92 acres in extent, excluding the space occupied by buildings, garden, and football field. It is divided into nine fields of equal size ($9\frac{1}{2}$ acres), besides a field of permanent pasture. The soil is very variable. The following is the rotation of crops:—

1. Rye.
2. Sugar beets and seed mangolds.
3. Oats.
4. Mangolds.
5. Barley.
6. Oats.
7. Clover and grass.
8. Grass.
9. Mangolds and different forage plants.

The average yield per acre is about 50 to 60 bushels of grain, 25 tons of mangolds, and 15 to 16 tons of sugar beets.

The stock consists of 30 milking cows, 20 bulls, heifers and yearlings, 100 pigs and about 150 fowls. The breed of cattle is the Red Danish.

In winter the rations of milking cows in full milk are $4\frac{1}{2}$ lbs. hay, 11 lbs. straw, 80 lbs. mangolds, and from 7 to 11 lbs. cake. During the summer about half the daily fodder (cake and hay) is given in the stable, the other half they get in feeding outside (tethered).

The average produce amounts to 8,700 lbs. of milk or 340 lbs of butter per cow.

SECTION 6: THE HUSMAND SCHOOLS.

There are 3 Husmand Schools in Denmark. They were established as private enterprises, to meet the recognized need of the Husmand (small farmer) for special instruction in the small cultures of his occupation.

THE SCHOOL AT RINGSTED.

The School at Ringsted is typical of the others. It and one at BARRØV in West Jutland each received a State grant towards their establishment, in the form of a loan of 60,000 Kroner at the rate of 3% interest. The grant from the

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State towards maintenance is 6,000 Kroner per annum. The School has two excellent demonstration kitchens for cooking. There are ample experimental plots for cereals and fodder crops; and illustration areas for general farming, for stock-keeping and fruit and vegetable growing, with large poultry premises.

The School was founded in 1903. By the end of the sessions of 1910-11 the Courses of 5 or 6 months each had been taken by 668 men and 610 women; and the short 11 day Courses by 1,592 men and 1,926 women.

The Summer Courses are of three kinds:—

A 6 months Course for young gardeners;

A 6 months Continuation Course for young farmers;

A 5 months Course in housekeeping.

The Winter Courses are of four kinds, and are each of 6 months:—

A Course in agriculture;

A Course in industrial work;

A Course in gardening;

A Course in housekeeping.

During both summer and winter there are 9 different 11-day Courses for men and women. These include agriculture, horticulture, care of animals, bees, fruit-growing, flower growing, cooking, dressmaking, maid-servant work and care of children.

The instruction is both theoretical and practical. During the summer students have 3 hours of lectures and 8 hours of practical work daily. In addition to the subjects already mentioned, instruction is given, to those who desire it, in some of the homely crafts, such as soldering, broom-making, cobbling, etc. In addition, there are studies and training in reading and reckoning, gymnastics, singing and general lectures.

FEES, FINANCES, MOTTO, ETC.

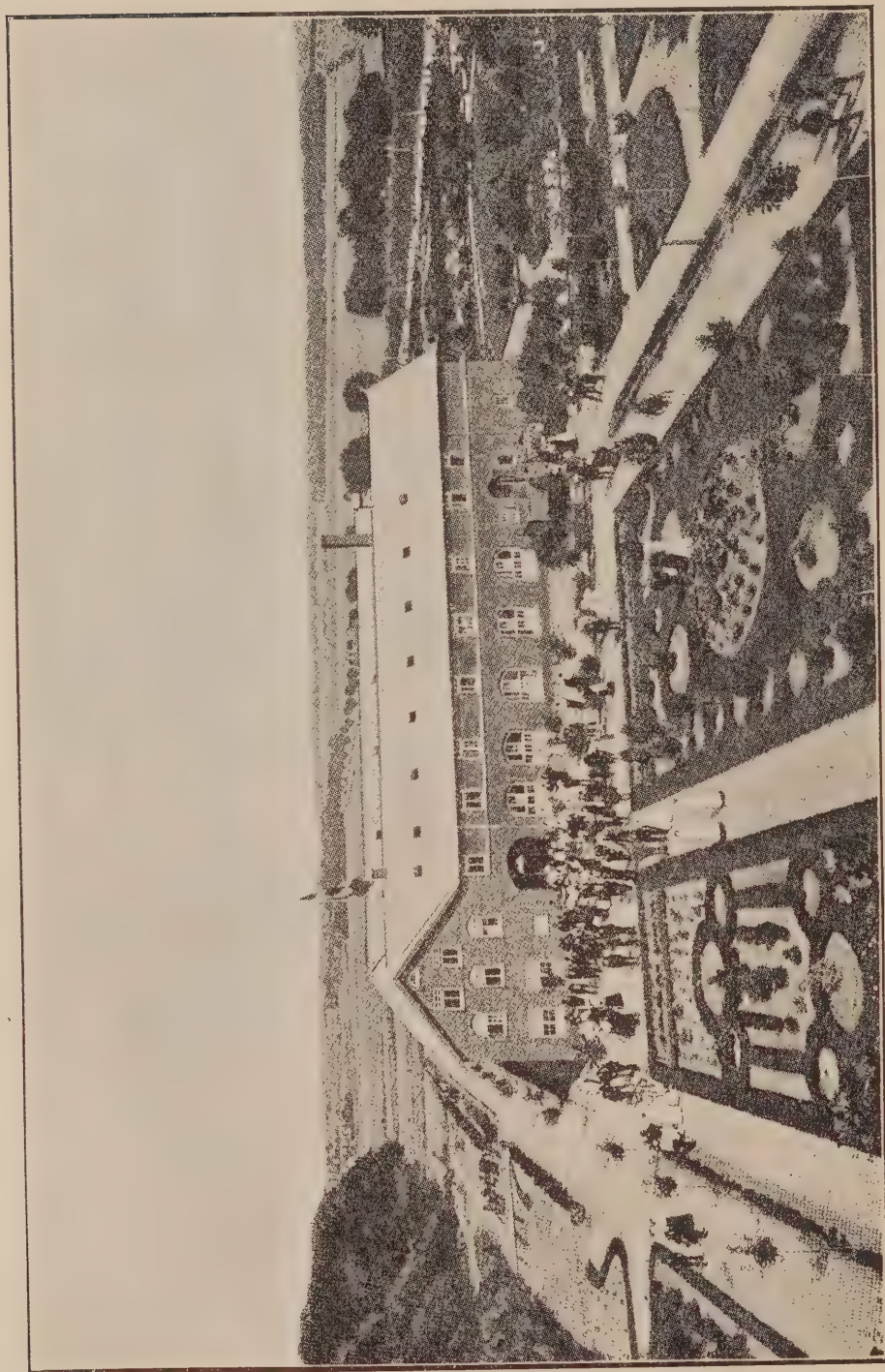
The fees for the 5 and 6 months Courses amount to 200 Kroner and 240 Kroner respectively. The fee for the first three months is at the rate of 45 Kroner per month. It drops to 25 Kroner for the last month. The fee includes instruction and board. An additional fee of from 18 Kroner to 36 Kroner is charged for the whole Course from those who have single, double, or four-bed rooms with special conveniences or comforts.

The State grants Scholarships up to 30 Kroner per month to enable students to attend.

The fee for the 11-day courses is 30 Kroner for each Course, including board and residence.

The State grants Scholarships, including an allowance for travelling expenses, for these short Courses.

About 40 men and women were in attendance at one short Course during the visit of the Commission. As distinguished from pupils in the People's High Schools, they are encouraged to use their notebooks freely—at least those whom we observed were doing that.

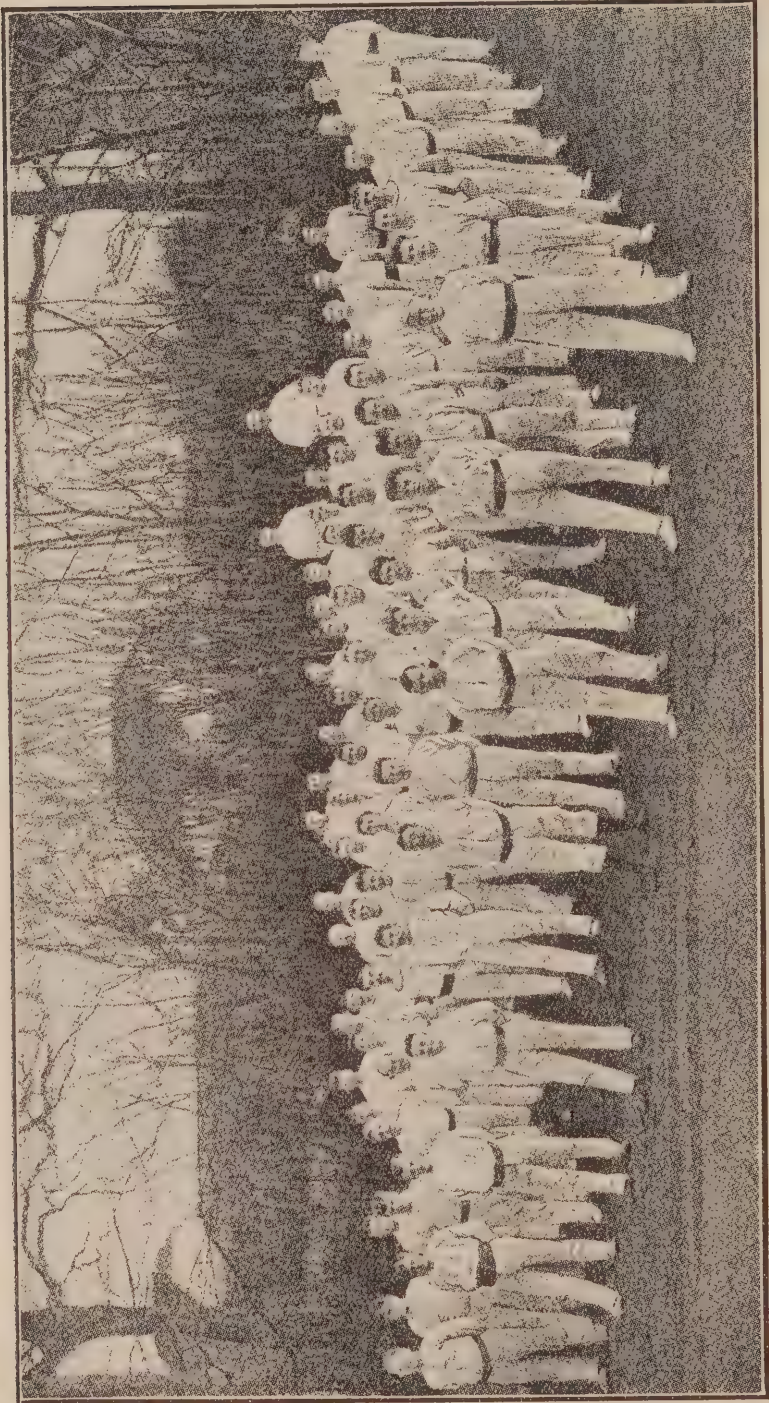


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RECREATION AT RINGSTED.



PHYSICAL CULTURE AT RINGSTED.

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PHYSICAL CULTURE AT RINGSTED.

The motto and device of this school are an example of the spirit and aim which seem to permeate the People's High Schools, the Agricultural Schools and the Husmand Schools. A free translation of the motto runs thus:—"He who does what makes other people happy, will be still happier himself". The device is an owl on a spade. It does not require much power of interpretation to think of that as Wisdom and Work.

SECTION 7: A SCHOOL FOR WOMEN FOR RURAL HOUSEKEEPING.

A few miles from Askov, a visit was paid to an institution for training young women for the duties of housekeeping and associated work at farm homes. As in the case of the People's High Schools and the Agricultural Schools, the institution is owned and managed almost independently by the Director and his wife, who are the principal instructors. Two Courses are held in the year, each lasting five months. Twenty young women are received each time. They are mostly from the families of farmers, who own and cultivate farms of from thirty to sixty acres. The students live in the institution. The cost of the Course for five months, including board, is 200 Kroner per pupil. The school has been going during five years. The classes are in housekeeping, cooking, sewing, dressmaking, gardening, poultry keeping and dairy work. They are for the direct purpose of training and informing young women in such a way that they may be competent in the duties that await them at the farm homes to which they return.

The following brief statements may be more useful than a mere printing of the headings of subjects of the Course of study.

The 20 pupils are divided into 3 groups. One group spends one month in the family kitchen, that is the kitchen which is used for the family of the principal and the teachers. The group of students is allowed 55 ore (13c) per day for each person in the group. They are expected to provide and serve wholesome meals within that amount.

During that month another group of pupils spends the time as follows:—One week in the institution kitchen, receiving instruction and being trained and gaining experience by practice. The following week, the forenoons in cleaning the rooms and preserving fruits, and the afternoons in gardening or other outside work. The third week, again in the institution kitchen. The fourth week, the forenoons in the care of the rooms, with sewing and dressmaking, and the afternoons in laundry work and ironing.

The pupils of the third group take the same kind of work as those of the second group, alternating with them in the institution kitchen week about during the month. The following month the second group changes with the first group, and in the next month the third group has its chance in the family kitchen. The six or seven pupils in each group stay together as a group during the whole of the course. The principal's wife, who is a trained and experienced teacher in Domestic Science, spoke well of the advantages of small groups of pupils over individual or separate work and study.

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HOW THE DAY IS SPENT.

The following table will illustrate how a day is spent;—

First Group.

5.45.....	Get up; arrange rooms.
6.30.....	Oatmeal breakfast, with morning singing.
7 to 8.....	House cleaning and laying table for family.
8.....	Breakfast of family and teachers.
8.30 to 9.30.....	Lecture.
9.30 to 12.....	Practical work in the kitchen.
12 to 2.....	Dinner and cleaning up.
2 to 2.30.....	Rest, or have time to themselves.
3.30.....	Coffee.
4 to 5.....	Lecture.
5 to 8.....	Free time, except for those who, in turn, make the supper.
8 to 8.30.....	Supper.

Second and Third Groups.

5.45.....	Get up; arrange rooms.
6.30.....	Oatmeal breakfast, with morning singing.
7 to 7.45.....	Theoretical instruction as to what is to be done during day.
8.30 to 9.30.....	Lecture.
9.30 to 12.....	Practical work—cleaning rooms, preserving fruits, or alternate weeks sewing and dressmaking. (Three of the group lay the table for dinner).
12.....	Dinner.
1 to 3.30.....	Gardening or other outside work; on alternate weeks work in the laundry.
3.30.....	Coffee.
4 to 5.....	Lecture.
5 to 8.....	Free time.
8 to 8.30.....	Supper.

In addition to the foregoing, students are expected to read a good deal, to write reports and to make calculations in connection with the work they do.

At the beginning of the Course ten periods are devoted to general instruction. After that, while they are working in groups, all the twenty pupils receive instruction in one class by lectures from 8.30 to 9.30 in the forenoons and from 4 to 5 in the afternoons. During the Course twenty-five dinners are studied as to the nutritive value of the commodities which make them up. The value of the food was put at from six to seven cents for a two course dinner per person. Each group, during some time in the Course, receives instruction in cookery for invalids.

Each student has a plot of about 25 ft. x 18 ft. in the garden for practice and instruction work. Each grows some of all the common vegetables on the plot. Besides these plots, there are larger plots which are rented by the groups of students from the proprietor, worked by themselves and used to provide most of the vegetables for their food. This is done for the sake of economy and also for the training which the girls receive in management in all its applications.

As in the case of the People's High Schools and Agricultural Schools, the poorer pupils may receive a bursary or Scholarship. It amounts to 25 Kroner per month, which, as in other cases, would pay about half the total cost of the five months Course when the cost of travelling to and from school, books, etc. are added to the 200 Kroner charged for the course itself.

Short Courses of fourteen days each are given three times during the year. Ten pupils are received at a time for the short Courses.

An example of the kind of work which is being done elsewhere: At the cooking school in connection with the Agricultural School at Haslev, 20 students from the adjacent People's High School receive instruction during their three months' Course; and a five months Course is provided in winter for girls of the locality. Before the cooking schools became common, there were travelling teachers for the wives of Husmend.

SECTION 8: ROYAL AGRICULTURAL AND VETERINARY INSTITUTE.

The following statement from the Report of the visit of the Scottish Commission on Agriculture to Denmark in 1904 describes the Royal Agricultural and Veterinary Institute at Copenhagen as fully as may be useful for Canada. The Canadian Commission concurs in the expressions of appreciation by the Scottish body.

The Royal Agricultural and Veterinary Institute in Copenhagen is the supreme teaching body (in Agriculture). This magnificent institution, which alike on account of its size, its revenue, its staff, its equipment, and the valuable contributions to agricultural and dairy science that have emanated from its research laboratories, forms one of the finest and most important colleges in the world, was established at the expense of the State for the purpose of training veterinary surgeons, teachers of agricultural science, agricultural experts and land stewards, and the sons of the larger farmers who desire to add to their knowledge of practical farming a complete course of training in the sciences relating to it.

The college buildings occupy a convenient situation in their own grounds at the outskirts of the city. They afford very ample and suitable accommodation. The main building forms three sides of a large quadrangle, and it contains about ten lecture rooms and about thirty additional rooms occupied as laboratories and museums. The rooms are all large, lofty and well lighted, and the numerous museums are filled with immense collections of illustrations and specimens of surpassing interest and value.

The veterinary department, in addition to its lecture rooms and museums, occupies a separate building in the fourth side of the quadrangle, which is separated from the main college building by a space of about 40 yards. This distance is found to be sufficient to prevent any nuisance from the live stock kept in the stables and hospitals. No live stock is kept at the college except what is required for the instruction of the veterinary students.

STUDENTS AND THE COURSES.

The total number of students attending the college during the past session numbered about 300, of whom 130 were students of Agriculture proper, including Dairying, while the remainder were students of Forestry, Horticulture, Land-Surveying, and Veterinary Science.

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The Course of study in Agriculture extends normally over two years, but a supplementary third year's Course is given, and is attended usually by a small number of advanced students who are qualifying for appointments as agricultural teachers. No shorter Courses of instruction are arranged than for a period of two years. Formerly many students attended the classes for one year only, but now the great majority take the full two years' Course.

The veterinary students' Course extends over four or even five years, and the full Course is taken by all the students, as that is essential to enable them to pass the necessary examinations.

Of the total number of agricultural students, Professor Bang expressed the opinion that about one-half intended to return to farming, and the remainder were preparing themselves for various situations.

The students, as in the Scottish universities and colleges, are non-resident, and provide their own board and lodgings in the city as they please. The fees charged for the regular Courses of instruction are very low, amounting to not more than \$14 to \$19 each.

THEORETICAL INSTRUCTION AND RESEARCH.

Alike in the agricultural and veterinary departments the subjects taught, and the arrangements of the classes, are similar to those in all similar institutions in this and other countries, and need not therefore be detailed. It is however, important to note that no farm is attached to this great college, nor is any attempt made to teach the students any branch of practical farming. The instruction given is purely theoretical, and the students are expected to acquire a knowledge of the practice of agriculture—where alone it can be learned—on the farm itself. The staff of the college includes 22 professors and lecturers, besides 12 assistants and tutors, and contains in its ranks a number of able men, of whom Professor Bang has a world-wide celebrity on account of his important researches and discoveries in animal tuberculosis. Attached to the college are large research laboratories, which receive an annual subsidy from the State of about \$36,960 per annum, in addition to the annual subsidy of \$70,040 given to the college. It is entirely due to this liberal support that the staff and equipment of the college have attained to such a high standard of ability and completeness, and that it has been possible to carry on these researches, which have produced results of such wide-reaching importance, not only to the dairy industry of Denmark and of the world, but also to the whole human race in those countries where tubercular disease has been for so long a dreaded scourge.

CHAPTER XXIX: AGRICULTURAL ORGANIZATION IN DENMARK.*

Agricultural organization has contributed materially towards the general development of Danish agriculture. Though old in years it is only within the last generation that it has really developed and branched out.

Denmark possesses many conditions favorable to growth of organization. Distances are short; population is comparatively dense; the people, generally speaking, live under similar climatic and economic conditions; and through their municipal system, founded in 1840, and through the influence of the Rural High Schools and Agricultural Schools they have gradually become ripened to support a well-developed organization.

The great railway extensions (1870-1880) created a new freer outlook for the people, and did much towards neutralizing the peculiarities and social class distinctions of individual districts, removing the former sense of isolation, facilitating personal contact and thereby that sense of co-operation which is the foundation of a richly organized life.

When hard times at the close of the seventies rolled over Danish agriculture like a tidal wave, refuge was again sought in that help which had formerly stood the test—organized effort. A large number of organizations were started which have undoubtedly done a great deal towards enabling the people to successfully ride the storm.

THE ROYAL DANISH AGRICULTURAL SOCIETY.

This is the chief corner-stone of agricultural organization, being not only the oldest organization of its kind in Denmark, but as stated by the celebrated historian, Prof. Edward Holm, "undoubtedly the first organization of importance which has been formed in our Mother Country for the purpose of promoting a great national aim". Its establishment in 1769, in the period preparatory to the great agricultural reforms brought about at the close of the century, was the result of the agrarian agitation of that day; and from its very inception the Society secured the co-operation of many of the best men of the country in its work for economic progress in Danish agriculture.

During the past four and a half generations the Society has promoted and carried through a multiplicity of useful measures which changing times and conditions have suggested, and which were considered beneficial to agriculture. It has nursed them, tested them, and when they succeeded brought them over the difficult starting points until they could be safely transferred to the State or to independent institutions.

*Condensed from a statement kindly provided by Mr. H. Hertel, Secretary, Royal Danish Agricultural Society.

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The State Government has frequently sought the counsel and acted on the advice of the Society, to whom it has referred the administration of measures which had its endorsement and financial support. This applies at present to the services of consulting experts in the several branches of agriculture; supplementary training of creamery buttermakers; official tests of agricultural machines and implements; and various lines of field experiments which are placed under the immediate supervision of special committees appointed by the Society for the purpose.

Outside of expert matters, the State Department of Agriculture does not directly employ agricultural experts (as in France, England, Norway and Sweden), nor any specially qualified Agricultural Council (as in Prussia and Belgium); hence the Government uses as its advisers the Royal Danish Agricultural Society, the Royal Agricultural College, the Central Co-operative Associations, the Veterinary Board of Health, and others.

Other fields covered by the Society are:—Publication of Agricultural Literature, Training of Pupils, Creamery Instruction, Feed Stuff Control in the Free Port of Copenhagen, and the investigation by committees of matters and conditions of immediate importance to agriculture. The Society endeavors to solve practical questions in a practical way through prize awards and public lectures; awards prizes and medals for agricultural industry, and gifts of books to Parish lending libraries; organizes agricultural conventions; and acts generally as a connecting link between domestic and foreign agricultural institutions. The management consists of 3 Presidents, 36 Directors, Secretary and Treasurer. The Presidents and one-half of the Directors are elected by the members of the Society, the other half by Farmers' Associations, one member for each county. Thus every section has opportunity to affect the activity of the Society, which becomes truly the representative of Danish agriculture.

The membership is between 750 and 800, and the annual fee is 20 Kroner (\$5.40).

FARMERS' ASSOCIATIONS.

When the agricultural reforms were carried through in the latter part of the eighteenth century and conditions were created for rural progress, patriotic men conceived the idea of establishing organizations for "the promotion of morality and ability among the rural population." These developed later into Farmers' Associations, which have greatly increased in importance, and now stand as the organization through which effect is given to the general development of agriculture.

The first local Farmers' Association was founded in 1805; in 1850 there were 25 Associations, in 1860 about 40; now there are 116, with a membership exceeding 86,000, who pay in annual fees 201,000 Kroner (about \$54,270).

The activities of the Farmers' Associations are directed more particularly along cultural and technical lines, while as a rule they do not touch social and political problems. Their main efforts include live stock shows, exhibitions and lecture courses. They direct farm competitions, local field experiments, and

the co-operative purchase of fertilizers and feed stuffs; they also carry on local fertilizer experiments, etc.

Some Associations publish official organs for their members; others issue annual reports. A number of them employ consulting experts.

The work of these Associations is managed by Boards of Directors elected by the members at their general meetings, held once or twice a year, in the Spring and Autumn.

PROVINCIAL ORGANIZATION.

To avoid the danger of the work and efforts of the Farmers' Associations becoming weakened or divided on account of too many locals being established, and as a number of problems presented themselves which could not be handled by their individual limited means, the Local Associations have formed themselves into five Provincial Associations. The latter have developed a great and important activity through the large Provincial live stock shows and exhibitions, through the lecture courses in Local Associations, publication of hand books, herd competitions, establishment of benefit societies, competitions among well cultivated small holdings with educational trips for the owners, establishment of local field experiments and demonstration fields, establishment of domestic science night schools, etc. Each Provincial Association holds an annual meeting of delegates to which Local Associations send representatives, when the programme of the following year's work is discussed and formulated. Such annual meetings of progressive farmers from different localities contribute greatly to the advancement of the work of the Local Associations. Their work is here submitted to a test and investigation that makes for increased solidity; and that brings uniform efforts to bear upon subjects which can be promoted only by being handled uniformly in all localities in the Province.

NATIONAL EXECUTIVE.

Many of the problems being identical in all parts of the country, the several Provincial organizations formed, in 1893, a National Executive of 13 members selected from the five provinces. This Executive determines matters that are to be submitted to the Provincial meetings of delegates, and seeks to increase the influence of the Provincial organization with all the Locals included in the Provincial Associations.

SMALL HOLDERS' ASSOCIATIONS.

Although the Farmers' Associations of late years have sought in an increasing measure to assist the owners of small holdings, it was anticipated that the time would come when the latter would demand their own special organizations. In 1901 Small Holders' Associations were started. Although in a measure working along the same lines as the Farmers' Associations, these newer organizations, on account of their special conditions and the difference between the smaller and the larger farms, have paid special attention to matters which the older associations as a rule did not touch, viz:—seed culture, market gardening, bee and poultry keeping, domestic industry, etc.

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In 1902 the individual Small Holders' Associations formed five Provincial Associations, and in 1903 a National Executive of 11 members whose object it is to work for organized co-operation among the individual associations, and to represent all the Locals included in the organization in their relations with the State and with other institutions of various kinds.

The five Provincial Associations comprise:—in Jutland 380 Locals with 20,600 members; in Zeeland 198 Locals with 12,000 members; in Fyen 110 Locals with 4,000 members; in Lolland-Falster 20 Locals with 1,350 members; in Bornholm 15 Locals with 1,000 members. This gives a total of 723 Local Associations with 38,950 members; and adding 116 Farmers' Associations with 86,000 members, we have the marvelous showing of 839 Associations of agriculturists with 124,950 members within a territory no larger than that part of the Province of Quebec south of the St. Lawrence River and east of Quebec City.

SPECIAL ASSOCIATIONS.

During the past two decades a large number of special organizations have grown out of the Farmers' Associations, and these have taken up special problems for solution and have given them closer attention than the Farmers' Associations could possibly bestow upon individual objects.

Horse and Cattle Breeders' Associations were formed after the passing of the Domestic Animal Act of 1887. The first of the *Swine Breeders' Associations* was started in 1894. The first *Sheep Breeders' Association* was formed in 1903. Usually each Breeders' Association includes a parish, and has for its object the development of domestic animals by the use of good sires to selected females owned by the members. There are now about 270 Horse, 1,260 Cattle, 253 Swine and 102 Sheep Breeders' Associations in Denmark. They have all to some extent formed Provincial organizations in order to promote uniformity in their work.

Three large *Poultry Associations* work for the advancement of the poultry industry. Other organizations seek to promote *Bee Keeping*, etc.

The *Dairy Record Associations'* object is to place the live stock industry upon a profitable basis, by the discovery and disposal of unprofitable individual animals. They carry on a systematic investigation and record of the feeding and of the milk and butterfat yield of the individual cows in the herd. Other branches of the farmer's business such as swine, etc., are gradually being brought in under a similar system of control, and conditions are thereby created for an improved system of farm book-keeping. The first Dairy Record Association was inaugurated in 1895; now there are more than 500, and these in turn have organized provincially. The work of these Associations is being copied by other countries and is receiving considerable well merited attention abroad.

Finally, reference may be made to a number of branch organizations of the parent stock which seek to improve the fruit industry, gardening, plant culture, etc., but space does not permit of detailed description.

The *Agricultural Credits Associations* were established under Law of 26th March, 1898. Their object is to advance to their members temporary loans for current working expenses. The loans may not exceed 3,000 Kroner (\$810)

in amount nor nine months' time in a year. The State Treasury has placed 5,000,000 Kroner at the disposal of these Associations, payable in cash and drawing interest at the rate of $3\frac{1}{2}$ % per annum. There are at present 168 such Associations, 123 in Jutland and 45 on the Islands.

DAIRYING ORGANIZATIONS.

Dairying is the most important special branch of Denmark's agricultural industry, and two kinds of organizations have been formed for its advancement, namely, *The Creamery Associations* and *The Danish Creamery Buttermakers' Associations*.

The former, 21 in number, include 900 creameries. They conduct educational butter shows and lecture courses. They gather and compile statistical information and records to show the economic side of creamery management. They conduct co-operative purchase and distribution of creamery supplies, etc. These Associations have also formed Provincial organizations in Jutland and Salland for the purpose of providing a connecting link between the individual Associations, and on the whole to watch over the interests of the industry. Further, following the example of the Farmers' Associations, the Provincial Creamery Organizations have formed a National Executive composed of the presiding officers of the several Provincial organizations who enquire into and make recommendations regarding subjects which ought to be brought up for consideration and discussion at the annual meeting of the delegates, and on the whole work for united action within the dairy industry.

The Buttermakers' Association was founded in 1887. It works for professional development by the union and increased training and ability of its members. It is divided into 24 Locals, each with its committee of management and self government. It holds an annual meeting of delegates and publishes an official organ. It has now a membership of about 1,800 and is directed by an Executive Committee of 7 members.

These dairy organizations have, in turn, branched out. There are, for instance, six Butter Export Associations of which the most important is *Danish Creameries Co-operative Butter Export Association* with an annual business of upwards of 12,000,000 Kr. Another has an annual turn over of about 8,000,000 Kr.

There are also the *Danish Creameries Butter Marks Association* with a membership of 1,326 creameries. Its object is to use a uniform Trade Mark, registered in Denmark and in England, on all packages containing Danish butter.

There are also the *Danish Creameries' Co-operative Supplies and Machine Shop* and various others.

CO-OPERATIVE ASSOCIATIONS.

Reference to the Export Associations brings us into the field of organized Co-operation. We consider 1866 as the year of its birth, when the first co-operative store was established, but it is only during the latter two decades under the pressure of declining markets that co-operative activities have gained full power.

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The Co-operative Associations have taken up joint purchase and sale, joint production and improvement of farm products.

Through 1,164 co-operative creameries, 38 co-operative pork packing establishments, and more than 1,250 co-operative stores, through Danish Co-operative Egg Exports, through some 20 Associations organized for the purchase of supplies, fertilizers, feed stuffs, etc, they contribute towards the widest possible dissemination of the results of experience gained from time to time. Through them the farmer is in a large measure placed under the control and supervision of his peers, and gradually trained to keep his own wilfulness within certain well defined limits, and let his minor individual interests give way to the greater common interests.

The co-operative principle is gradually creating a feeling of solidarity, a community spirit allied with the best thought of the times.

The several co-operative organizations have joined forces through centralization. The co-operative creameries have already been referred to. The co-operative pork packing establishments have formed an organization, known as *The United Danish Co-operative Pork Packing Association*, to look after their joint interests in relation to the legislative powers, to transportation and market problems, and for the rational development of the swine industry, etc.

The co-operative stores have established a wholesale house from which 1,250 stores are supplied with merchandise.

Danish Co-operative Egg Exports is in reality the union of some 550 Local egg circles.

The several Provincial organizations formed in 1898 the *Central Co-operative Committee of Denmark* to watch their joint interests abroad. Ten Provincial and National co-operative organizations are at present represented on this Committee, and others may obtain representation upon a two-thirds vote of the Committee. "The Co-operative Journal" is the official organ.

The foregoing sketch of the agricultural organization is drawn in broad lines and omits much. For instance, the *Agricultural Mutual Benefit and Educational Organizations* are also worthy of mention, such as domestic servants, workmen, savings and insurance Associations, etc.

Sufficient has been said, however, to convey an impression of the throbbing, comprehensive, practical and energetically directed agricultural organization which in its many ramifications has contributed so much towards agricultural development in Denmark, and which has in several ways served as an example to other countries.

TRAVELLING SCHOLARSHIPS.

For more than half a century, under the auspices of the Royal Agricultural Society of Denmark, grants were made to assist young farmers to visit some of the best farms in the various districts in the Kingdom. The following is quoted from the evidence of Dr. Robertson before the Canadian Parliamentary Committee on Agriculture: "When I went to Denmark first, 25 years ago, I learned that the leaders of the movement for the improvement of agriculture there recognized the value of the teaching power of the most successful farmers in the Kingdom.

The Royal Agricultural Society by means of grants enabled hundreds of young farmers to learn the systems and methods of farming from many of the best farms in the country. These young farmers lived and worked and learned on these selected farms. The period might be three months or six months or a year; and sometimes a young farmer would work on two, three, or even four such farms before he returned to his own home. I, myself, visited a farm where 70 such student farmers were working. They were not going to college to be trained in the theories; they were on this farm to learn how that farmer farmed to make money.

"That farmer kept 250 dairy cows. He also grew a large quantity of sugar beets. I think he had 700 acres in that farm. These young farmers were given instruction in the theories once a week. The practice was not confined to large farms. All over Denmark the best farmers of the locality could have their farms approved and receive these young farmers who came under grants from the Royal Agricultural Society. In general the conditions were that the student farmer must work for three or six months or a year, and at the end of every period write a report to the Society upon what he had seen and done and learned. In a few years the best practice of the best farms became the common knowledge of the farmers of the whole kingdom.

"By means of that system the best farms, where the men were doing remarkably well, became known all over Denmark, and more than that their systems and methods were adopted. Afterwards came the co-operative organizations for creameries, and bacon curing establishments. These co-operative societies are for managing some part of the agricultural business of the locality and not for doing the farmwork. Every locality is practically doing for itself in detail what the Royal Agricultural Society did for the Kingdom long ago. The community spirit which the Danes have in a very large measure—more than we have as yet, perhaps because of the conditions of their national life in the past—has been applied to the problems and difficulties of the farms; and so they have risen from poverty, from dire poverty after the war with Germany, to being regarded as the most prosperous agricultural people as a whole on the face of the earth to-day. I know localities in Canada where farmers are doing better than in Denmark. I know such localities also in the United States and in England and Scotland. The Danes excel in having levelled up in general; we in Canada excel in the exceptions. Take one illustration. They send large quantities of butter, bacon and eggs to the United Kingdom. They get high prices because of the superiority of the quality resulting from their methods of managing. They take out of the United Kingdom annually over eight millions of dollars more than other nations obtain for an equal quantity of the same products. They get more, as a premium on the quality of their butter, bacon, and eggs, than is spent on our whole system of rural education in Canada. That is a large tribute collected from a foreign nation by the ability of these people. They are using it for further training and further enlightenment and further development. Fifty years ago students were sent from Denmark to Scotland to study agriculture there. Since that time the practice continues for some farmers' sons to spend 6 months, a year or more on Scottish farms.

FRANCE.

CHAPTER XXX: OUTLINE OF THE EDUCATIONAL SYSTEM.

SECTION 1: ORGANIZATION AND ADMINISTRATION.

UNDER THREE MINISTRIES.

The different kinds of schools in France are under the control of three different Ministries. The ordinary Primary, Secondary and Higher Schools, the Schools of Art, Normal Schools, Law Schools, Medical Schools and Universities belong to the Ministry of Public Instruction. The Commercial and Industrial Schools, including the General Technical Schools, are under the Ministry of Commerce and Industry. The Agricultural Schools are under the Ministry of Agriculture.

It is claimed that the Industrial, Commercial, Technical and Agricultural Schools gain much from their close relations with the Ministries of Agriculture and Commerce and Industry respectively, which are in touch with the great industrial employers, and find the practical side of their work recognized and appreciated by those who are most interested in it.

What appears to be an anomaly of the system lies in the circumstance that since University Education is under the Ministry of Public Instruction, the higher scientific branches of Industrial and Commercial Education have no organic or direct relation with the lower schools providing less advanced education of the same character. For example, the Agricultural Branch of the University of Nancy, and the Tannery School at Lyons in connection with the University there, are under the Ministry of Public Instruction and not under the Ministries of Agriculture and of Commerce and Industry respectively. In the actual working out of the system the disability of the anomaly is more apparent than real.

DUTIES OF THE DISTRICT RECTORS.

For administrative purposes France is divided into 16 School Districts. At the head of each District is a Council which supervises the method of teaching prescribed by the Minister of Public Instruction, acting as a Higher Council of Public Instruction. Each of these Districts is administered by an official known as Rector, assisted by as many inspectors as there are departments (provinces) in the district.

These rectors locally represent the Central Authority, and supervise the provision of education in the Districts which they respectively direct and in

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which they reside. As their authority embraces all grades of education, their influence is excellent and effective in regard to such questions as overlapping on the one hand or deficiency in any particular grade on the other. They also furnish an effective medium for spreading the principles of the Government schemes throughout every District, at the same time adapting their application to local conditions.

FUNCTIONS OF THE INSPECTORS.

Advantages accrue from the influence upon education, above the elementary stages, through the local knowledge and influence of the Rectors and the Inspectors.

As the Inspectors are freed from all duties of determining the grants, examining individual children for labor exemption, or passing candidates for any form of teacher's certificate, they are able to give full time and thought to the actual methods and working of the schools, and to criticising, offering suggestions and encouraging the various attempts to improve the education given.

The general Inspectors and Inspectresses of Public Instruction and their assistants have to inspect public schools which provide technical instruction of elementary and secondary grade, schools and courses of vocational instruction supported by the Ministry, and private technical schools of any kind recognized by the State. They may be placed at the disposal of the Ministry of Commerce and Industry for special journeys of inspection in certain schools and Districts.

THREE GRADES OF EDUCATION.

In France there are 3 grades of education, each of them including gradations or variations:—

(1) *Primary Education*, to which the great majority of French people are limited, is given in the primary schools and in the lower classes of the lyceums, colleges, etc.;

(2) *Secondary Education*, which is suitable for the children of rich or well-to-do families, and also for talented children of the poorer classes who are able to win scholarships. This education is given in the lyceums, colleges, small seminaries, and in a large number of private institutions;

(3) *Higher Education*, which is given in the Universities and in some special establishments, for those who intend to be doctors, magistrates, lawyers, teachers in the secondary or higher grades, etc.

The teaching is called *public* when it is given by masters dependent directly upon the State, the departments or the communes; it is called *private* when organized by individuals or associations. Public instruction predominates in France, although private teaching also forms a prominent feature of education.

Examinations in all grades are set by the University. The programmes are decided on by the Higher Council of Public Instruction, and therefore all teaching must necessarily be dependent on it. These examinations lead to diplomas which are required when entering the majority of callings.

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Education in all its grades has been considerably developed in France within the last 40 years. In 1870 the State spent 32 millions of francs for education; now it spends annually nearly 275 millions of francs (\$55,000,000).

SECTION 2: PRIMARY INSTRUCTION.

Primary instruction is compulsory throughout France. This instruction has never been considered by the French authorities as an end, but rather as a means; something indispensable but insufficient; a rendezvous, so to speak, for all, from which each child is to start on his own proper course, a course determined by his taste, aptitude, family and social standing.

The Primary Schools of France correspond with our Elementary Schools, or, to be more definite, with our first seven or eight grades, those which hold the children from their fifth to twelfth or thirteenth year. The French educators discovered that, at the end of this period of training, "some children being better endowed intellectually, and belonging to families of moderate means, in easy circumstances, entered the Superior Schools to complete their instruction there, or the Lyceums or Colleges to prepare themselves for the liberal professions or the Universities. Others (and they form a very large majority), were hardly out of the Primary Schools before they were struggling with the difficulties and exigencies of life. Among this class a few continued their studies in the supplementary courses, but most of them, since they were poor or unwilling to ask their parents to make any greater sacrifices to keep them in school, entered a workshop that they might begin to earn a livelihood at once."

In 1881 primary instruction was made free in all the public schools. In 1882 it was made compulsory for fathers to send their children to school until they had obtained the "certificate of primary studies" or attained the age of 13. Thanks to these measures, the proportion of illiterates considerably diminished. In 1854 it was 21.6% for men and 47.4% for women; in 1870 it reached 25% for men and 37.7% for women; but in 1908 it was hardly 11%.

PUBLIC PRIMARY SCHOOLS.

The obligatory school age is from 6 to 13 years under the law of 1882. The total enrolment in Primary Schools in 1906-07 was 5,585,025 (divided almost equally between the sexes) of which 4,583,053 were in public schools and 1,011,072 in private schools. In addition to these totals, there were 651,955 pupils in Infant Schools, the establishment of which is optional with the communes, these children being below the obligatory school age.

Children are admitted from the ages of 6 to 14. Outside of these limits the admission of pupils is subject to the authorization of the Academy Inspector.

In communes where there is no kindergarten, the age-limit for admission is lowered to 5 years.

The classes are held 3 hours in forenoon from 8.30; and 3 hours in afternoon from 1 o'clock.

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Thursdays, Sundays and feast days are observed as holidays.

Primary education comprises the following:

Moral and civic instruction; reading and writing; French; calculations and metric system; history and geography, with special reference to France; object lessons and primary rudiments of science; elements of drawing, of singing, and of manual work, especially in their application to agriculture; (needlework is taught in the girls' schools); and gymnastics and military exercises.

Education in the primary schools is divided into three courses—Elementary, Intermediate, and Superior. In the infant section the course is for one or two years, depending on the age of the child upon entering being 6 or 5 years. The Elementary course is two years, ages from 7 to 9; Intermediate course, 2 years, ages from 9 to 11; Superior course, 2 years, ages from 11 to 13.

Each Primary School is under the care of a School Committee, which looks after the welfare of the children, provides shoes and winter clothing when needed and a warm meal at noon.

Though Higher Primary Education is free, it is not furnished everywhere. For this reason scholarships have been founded for those who are willing to go some distance from home in order to get this instruction, but who cannot afford their living expenses.

On leaving the Higher Primary School those who intend to go into business and who have a taste for the study of modern languages can compete for a scholarship to enable them to reside abroad; and those who intend to go into the manufacturing industries may compete for a travelling scholarship. The secondary teaching scholarships are of old standing and their benefits have been extended to girls. The number of scholarship holders is no longer restricted to the military and naval schools, and lack of means is now a sufficient qualification.

The gates of higher education also have been thrown wide open by means of financial aid to a large number of young persons.

SECTION 3: HIGHER PRIMARY SCHOOLS AND SUPPLEMENTARY COURSES.

Higher primary education was inaugurated in 1882, and to-day there are about 370 Higher Primary Schools and over 600 Supplementary. The Higher Primary Schools were reorganized by a decree and an enactment of January 21, 1893.

The Minister of Public Instruction at that time, Mr. Charles Dupuy, sent a circular to the Rectors on that occasion, of which the following passage is an extract:

What school population do our higher primary schools cater for? Not for young persons who are intended for professional careers, who have an indefinite amount of time at their disposal and who have come to receive high intellectual culture, but rather the children of the laboring classes who will soon have to support themselves by working, and in most cases by manual labor. They do not aspire to classical studies. Their ambition and probable destiny is to fill one of those numerous employments of a medium order which agriculture, commerce, and industry offer to workers, with the prospect of attaining to more and more easy circumstances; but nevertheless only moderately so.

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This being the case, the higher primary school must direct the attention of its pupils, from the first day to the last, to the necessities of the practical life which awaits them, and therefore their minds are never distracted for a moment from the pursuit of a calling; and the school carefully avoids giving them standards, habits or ideas which would divert them from the kind of life and work for which they are nearly all intended. And whilst reminding them that democracy has removed the barriers which formerly held the individual tightly imprisoned, it seeks rather to make him love and honor his calling than to dream of means for escaping from it.

In this way, we might mention that higher primary instruction is clearly distinguished from secondary instruction, ancient or even modern, with which it has been confused.

Higher primary instruction (and one of my honorable predecessors has already said so even at the very time when he was reorganising it) must not be by any means a sorry counterfeit of secondary teaching; the higher primary school is not a degenerated college, but a perfected school. Nothing, then, is more necessary and more simple than to prevent any confusion or any ill-ordered rivalry between two orders of establishments which has each its reason for existing.

Higher primary instruction is at once recognized by its absolutely practical and utilitarian character; and in this general sense it is professional (vocational).

But it is none the less real instruction, and is not to be confounded with apprenticeship. It is a school and not a workshop, and those who attend it are pupils and not apprentices. The work of education will be continued there which was commenced at the primary school. Even for workmen (or should we not rather say, particularly for workmen) this culture of the mind is not a misplaced luxury; it forms the judgment, the heart, the will and the character; that is to say, the strength which he more than any one else will need in the struggle for existence.

Therefore our higher primary schools have had this double object in view from the very start: they combine intimately a supplementary general education with the rudiments of a professional (vocational) education.

DISTINCTIONS BETWEEN HIGHER PRIMARY AND SUPPLEMENTARY.

The institutions for higher primary instruction are called *Supplementary Courses* if they are annexed to an elementary primary school under the same management.

They are called *Higher Primary Schools* if located in separate premises and under a different management from that of the elementary school.

The duration of the studies in the *Supplementary Courses* is one year. The *Higher Primary School* comprises at least 2 years of study; it is called a complete course if it comprises 3 or more.

In 1906-1907 the higher primary instruction included 87,668 pupils, distributed as follows.

	PUBLIC INSTITUTIONS.		PRIVATE INSTITUTIONS.	
	Boys.	Girls.	Boys.	Girls.
Higher Primary Schools.....	26,947	18,518	220	293
Supplementary Courses.....	16,523	13,508	2,784	8,875
	43,470	32,026	3,004	9,168
	75,496		12,172	

In 1891-92 the same instruction had been given to only 45,599 pupils.

No pupil can be received into either a Higher Primary School or a Supplementary Course unless he holds the certificate of elementary primary studies, and also proves by certificate signed by the Primary Inspector that he has attended during at least 1 year the higher course of an Elementary Primary School. Nevertheless pupils who have not prosecuted their studies in a primary public school, if they hold the certificate of elementary primary studies, may be admitted into a Higher Primary School or a Supplementary Course on proving that they studied the subjects comprised in the program of the higher course in the primary public schools. This Supplementary examination is undergone before a commission composed of the teaching staff of the Higher Primary School under the chairmanship of the Primary Inspector.

HIGHER PRIMARY INSTRUCTION.

Higher primary instruction comprises:—moral education; civic instruction; the French language and the elements of French literature, French history and the elements of general history, with special reference to modern times; the geography of France and its colonies, and the elements of general geography, with special reference to commercial and industrial geography; modern languages; elements of common law and of political economy; elements of arithmetic and its principal commercial applications; elements of algebra and geometry; the rules of ordinary accounting and bookkeeping; elements of the physical and natural sciences, with special reference to their application to agriculture, commerce and manufacturing; geometrical drawing; ornamental drawing and modeling; gymnastics; wood and iron working for boys; needlework, cutting, and dressmaking for girls.

TECHNICAL SECTIONS.

In the schools for complete training, in which there are a considerable number of pupils, there are generally special sections from the 2d or the 3rd year onwards:—agricultural, industrial or commercial.

In all the other Higher Primary Schools, as also in the Supplementary Courses, additional courses may be established for the vocational preparation of pupils who intend to go into farming, industries or business.

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TIME TABLES.

The regulation time tables of the Higher Primary Schools are as follows:—
PROGRAMS OF HIGHER PRIMARY PUBLIC SCHOOLS IN FULL OPERATION.

BOYS

Subjects of instruction and No. of Hours to each (total 30 per week).	GENERAL INSTRUCTION.			INDUSTRIAL SECTION.		BUSINESS SECTION.		AGRICUL- TURAL SECTION.	
	1st	2nd	3rd	2nd	3rd	2nd	3rd	2nd	3rd
Ethics.....	1	1	1	1	1	1	1	1	1
French Language.....	5	5	4	2	2	2	2	2	2
Writing.....	1	1	1	1	1	1	1	1	1
History and Civic Instruction	1	1	2	1	1	1	1	1	1
Geography.....	1	1	1	1	1	2	2	1	1
Modern Languages.....	3	3	2			4	4		
Mathematics.....	4	3	3	3	3	2	2	2	2
Accounting and Bookkeeping.....		1	1	2	2	3	3	1	1
Physics and Chemistry.....	2	2	2	2	2	2	2	2	2
Natural History and Hygiene	1	1	1	1	1	1	1	2	2
Agriculture and Horticul- ture.....	1	1	1					3	3
Common Law, Political Econ- omy.....			1		1		1		1
Drawing and Modeling.....	3	3	3	4½	4½	1½	1½	1½	1½
Manual & Agricultural Work	4	4	4	6	6	2	2	6	6
Gymnastics.....	2	2	2	2	2	2	2	2	2
Singing.....	1	1	1	1	1	1	1	1	1
Hours to be distributed accord- ing to special requirements				2½	1½	4½	3½	3½	2½

The figures in the columns give the number of hours per week of each subject. The ordinal numbers (1st, 2nd, 3rd) refer to the year of the course.

GIRLS.

(Total 24 hours per week)	GENERAL INSTRUCTION.		
	1st	2d	3d
Moral Education.....	1	1	1
French Language.....	4	4	4
Writing.....	1	1	4
History and Civic Instruction.....	1	1	1
Geography.....	1	1	1
Modern Languages.....	3	3	3
Arithmetic & Elements of Geometry.....	2	1	1
Accounting and Bookkeeping.....		1	1
Physical and Natural Sciences & Hygiene.....	2	2	2
Common Law and Political Economy.....			1
Drawing.....	3	3	3
Manual Work and Domestic Economy.....	4	4	4
Gymnastics.....	1	1	1
Singing.....	1	1	1

DETAILS OF SCHOOL WORK.

In the first three years of higher primary instruction there is an average of 6 hours of class work daily (Sundays and Thursdays excepted). The maximum time on any subject does not exceed $1\frac{1}{2}$ hours daily, distributed weekly approximately as follows: literary instruction 9 hours, scientific instruction 9 hours, modern languages 3 hours, drawing 3 hours, manual work 4 hours, music 1 hour.

Gymnastic and military exercises are carried on outside of the regular class hours.

In the 4th and higher years the time devoted to manual work and vocational instruction is increased; but at least 10 hours are reserved every week for the other subjects of instruction.

The instruction in the Supplementary Courses aims to revise and supplement the subjects taught in the higher course of the Primary Schools. Teachers are authorized to select from the programmes of the Higher Primary Schools, and especially those of the 1st year, whatever they may consider to be of special utility for the pupils attending the Supplementary Course.

A Welfare Committee has been established in every Higher Primary school which watches the material interests of the pupils and the school property, takes the pupils under its protection, obtains situations for those who merit it on completing their studies, and takes especial care of the scholarship holders.

SECTION 4: PRIMARY TECHNICAL INSTRUCTION.

The State organization of primary technical instruction in France dates from 1878, when the display of French Industry at the Paris Exhibition in that year was held to be unsatisfactory, and the matter was discussed in the Chamber of Deputies, leading manufacturers and Chambers of Commerce having directed the attention of the Government to the question. Propositions leading to the creation of an independent system of primary technical instruction were submitted, but rejected, and it was finally agreed that it should be annexed to the existing Primary Schools. As a result, the law of December 11, 1880, was passed providing for Schools of Manual Apprenticeship, these to be assimilated, as regards support and regulations, to the Higher Primary Schools having a distinctly technical character.

In the same year the Legislature authorized the creation of another order of schools, called National Professional (Vocational) Schools, which were intended to illustrate the kind of primary education that might replace in society the decaying apprenticeship system by an effort beginning with the infant school and following the child to the adolescent period, giving, at each stage, "technical instruction which, commencing from the earliest age, when it is of little importance, continues up to the very end of the course, when it becomes of the first moment. When he has arrived at this final stage the apprentice, who now only needs the practice of his trade to become a workman, leaves the National School and goes either into a workshop or into a technical school in the proper sense of the term." It was believed that such schools would

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"lead a youth to the threshold of the factory or the engineering school, armed not alone with general and with special knowledge, but with the aptitudes and habits of work which would enable him after a few months of practice in a particular calling to become a finished workman."

Three schools of this character were established in 1886-87, and liberally supported by the State.

PRIMARY TRAINING STRICTLY VOCATIONAL.

Primary technical training in France is distinctly vocational, is carried out with marvellous system and thoroughness, and everywhere it tends to specialization. The endeavour has been made at times to engraft the training upon the general system of primary education—an endeavour which would appear to be comparatively easy in France, where primary education is Pestalozzian in spirit and method and where the Higher Primary Schools all give more or less technical instruction.

At other times the endeavour has been made to emphasize general instruction in schools of the technical type. This was notably the case in the *Ecole de la Martinière*, the most famous of the primary technical schools of Lyons, which was established in 1830 by private initiative and is managed under a trust deed by trustees acting conjointly with the Minister of Commerce. The purpose of the school was "to give a sound, practical training to those who are to enter industrial or commercial life at a comparatively early age." For more than half a century it was educative in the general sense, preparing boys for industrial life, but not training them for the exercise of any particular calling. This policy was modified in 1895 by providing for technical specialties in the third year of the course. By this action, says an English authority, "the most important stronghold of a system of generalization in French primary technical instruction may be said to have fallen."

Although primary technical instruction in France arose from conditions of life and industry peculiar to that country, yet in purpose and methods it is a type of what vocational schools incline to be everywhere.

TECHNICAL INSTRUCTION DEFINED.

At the Universal Exhibition held in Paris in 1889 the most notable of the series of Congresses accessory thereto was one which discussed technical education and decided that "technical instruction in its broadest sense has for its object the study of the arts and sciences, in view of their application to a definite trade or profession. The training must be as varied as the trades and professions, its degrees being determined in each case by the end in view." It was decided that the term "technical instruction," without a modifying word, should be held to include both industrial and commercial training.

The Congress defined Primary Technical Instruction in France as that given in Schools of Manual Apprenticeship and in the Higher Primary Schools (that is, schools for pupils over 12 years old); Secondary Technical as instruction given in the Schools of Arts and Trades; Higher Technical as that

given in the Central School of Arts and Manufactures, and institutions of the same high order. This classification agreed in the main with the conditions under which technical instruction was carried on in France at that time.

Specialization was definitely adopted as the government policy by the law of 1892, which placed the Practical Schools of Commerce and Industry under the sole charge of the Minister of Commerce and Industry, thus removing them entirely from the system of general primary instruction. At that time a Department of Technical Instruction was created in the Ministry named, and appropriations covering salaries and many other expenses were offered through this Ministry for schools giving instruction in commerce and industry to pupils from the Primary Schools. Subsequently the National Vocational Schools were transferred to the same Ministry.

INTENSIVE SPECIALIZATION APPROVED.

In respect to the present policy it may be said that the principle of intensive specialization is generally approved by French authorities; but as regards the age at which specialization should be encouraged there is a conflict of opinion. The policy of the separate and not always harmonious administrations of the two types of primary education, general and special, by the different Ministries under whose care they are, prevents placid stagnation. This conflict increases as the need of professionally trained teachers for the Primary Technical Schools becomes more and more evident. Temporary provision has been made for meeting this necessity by the institution of Normal sections in several of the Higher Technical Schools; but this action threatens to introduce social distinctions among the laboring classes of France at the very time when an effort is being made to break down the long-standing distinctions between the lower and upper classes of society. On these two phases of the general problem of primary technical education—early specialization and dual administration of the two types of primary education—finality of judgment does not appear to have been reached.

SECTION 5: SCHOOLS FOR TEACHERS.

PRIMARY NORMAL SCHOOLS.

These train male and female teachers for the Primary Schools, private schools and Kindergartens. When the great primary education laws were passed, each Department had to have Normal Schools for male and female teachers separately, and these were established wherever they had been lacking, except that the Department of Constantine has no schools for girls, and that of Oran none for boys. The number of masters to be trained having diminished considerably, and it being costly to maintain two Normal Schools with but few pupils and a large number of professors, some Departments grouped themselves into pairs and shared in the expense of these two schools.

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Pupils are admitted by competitive examination held yearly in each Department. With the application for enrolment, the candidate must furnish a list of the schools he has attended since 12 years of age; his birth certificate, proving his age to be at least 16 and not over 18 on October 1st; primary certificate, and an undertaking to serve for ten years in the public teaching profession. Candidates must be free from all infirmities or ailments which would unfit them for teaching.

Age exemptions, not to exceed six months, may be granted by the principal. Candidates who do not hold a primary certificate may be enrolled temporarily, their admission taking effect only if they obtain it at the October session. No one may enter for the examination more than twice unless specially authorized by the principal.

EXAMINATIONS FOR ADMISSION.

The competition comprises two series of examinations, the first for selection of those eligible, the second for definite admission. The first comprises:

(1) Dictation of about twenty lines, followed by not more than 5 questions on the text, explanation of the meaning of a word, expression or phrase, analysis of one or more words, etc.

(2) Writing examination—one line each in large slanting, large round, and running style; 2 long lines; 2 medium and 4 fine; the value of the writing handed in at the orthographic composition being also taken into account.

(3) French composition, consisting of a story or letter of a simple nature, the explanation of a moral or educational precept, proverb, maxim, or question in moral and civic education.

(4) Arithmetic, comprising, in addition to the solution of one or two problems, the explanation of a rule, with reasons.

(5) Drawing, consisting of an exercise in simple sight drawing.

Examinations of the second series comprise questions on the French language, arithmetic and the metric system, history and geography of France, and on rudiments of physical and natural sciences; a summary of 2 lessons given by professors of the school, both on literary and scientific subjects; examinations in the elements of singing and music; gymnastic exercises; military exercises for male candidates, and sewing for female candidates.

After the competition a list of pupils definitely admitted is prepared for each school, with a supplementary list in order of merit like the first, from which the director fills vacancies as they arise, and which also serves to furnish neighboring academies with pupils when their numbers are incomplete.

Students at Normal Schools are called pupil-teachers. All have uniforms which they wear for holidays and outings.

COURSE OF INSTRUCTION.

The course of instruction occupies 3 years and comprises the following subjects:—

For both sexes:—psychology and ethics; pedagogics and school management, French language and elements of French literature, civic history and education,

geography, arithmetic and bookkeeping, physics, chemistry and natural sciences, modern languages, writing, drawing, singing and music, and gymnastics.

For young men:—geometry, surveying and leveling, agriculture and horticulture, agricultural and manual work, and military exercises. Since 1909, three lectures on the army and military service are given by officers.

For young women:—domestic economy, sewing, cooking, washing and ironing, and gardening. (In the schools at d'Alençon, Arras, Caen, Chambéry and LePuy, vocational instruction in hand-made lace has been organised.)

The general course of instruction is given during the first and second years, the practical and vocational in the third. Courses bearing on educational subjects which require the greatest amount of intellectual effort are held in the forenoon, the afternoon being reserved for manual work, drawing, singing, etc. During the third year pupil-teachers receive at least two months' practical instruction at the Primary School annexed to the Normal School, and each week in turn they give a lecture before the director and professors.

All pupils are required to undergo the examinations for the superior certificate at the end of the second year. At the end of the third year they must present themselves for final examination on normal studies, comprising a written exercise on a question in pedagogics, a lesson given to the pupils of the annexed school or the practice school, questions on the organization of a class, on school programmes, methods, etc. This final examination was introduced by the decree of August 4, 1905, which modified the form of education at the Normal Schools in a practical and professional sense. This decree has been applied in its entirety only since 1907.

Pupils who leave the school after three years of study are entitled, according to their capacity, to the first vacancies occurring in the Department.

Fourth year scholarships may be granted to those pupils who are preparing for the Higher Normal Schools.

HIGHER NORMAL SCHOOLS.

The Higher Primary Normal Schools (at St. Cloud for boys and at Fontenay-aux-Roses for girls) prepare students for teaching in the Normal Schools and Higher Primary Schools. The Higher Normal School (at Paris) furnishes professors for the secondary teaching of boys. The Normal School at Sèvres is the nursery for the secondary education of girls.

All the above Normal Schools prepare their pupils for a professional examination, at which they may obtain the necessary diploma for teaching. These Normal Schools are not exclusive, and the same examinations may be undertaken by all persons who fulfil the required conditions as to age, previous grades, etc. The pupils are boarders, supported and instructed free of charge, and have only to furnish their outfit. A certain number of day-scholars are also received. The pupils bind themselves to devote ten years to public instruction. Those who give up teaching before the expiration of this ten-year period must refund the State the sums expended for their support at the Normal School.

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SECTION 6: SECONDARY INSTRUCTION.

Less has been done for secondary instruction than for primary education. A large number of new and spacious buildings have been erected here and there for the lyceums, complying with the requirements of health and well-being. The organization of the instruction of boys has adjusted the courses to meet present-day requirements. Later efforts have been directed principally to the organization and extension of the secondary instruction of girls.

SECONDARY SCHOOLS.

The Lyceums are the typical Secondary Schools, and are established and maintained by the State. The local or communal Colleges are established by local authorities, the State contributing to their maintenance. Although the Colleges follow the same official programmes as the Lyceums, few of them offer the full secondary course of instruction, and hence form a sort of lower order of Secondary Schools, or a preparatory stage to the upper section of the lyceums. The modern courses of instruction in the colleges are co-ordinated. This movement is fostered by Government bursaries open to competition, enabling promising youths whose parents cannot afford the expense of college education to meet the tuition fees and cost of living. The Secondary Schools are not free schools, and this fact has determined their social distinction; hence the gradual co-ordination of primary and secondary systems is significant for social as well as educational reasons.

The Secondary Schools comprise the whole scheme of liberal education up to specialized University faculties and higher special schools such as the Polytechnic, the National Conservatory of Arts and Trades, etc. The University faculties of Science, with their recent equipment and laboratories and technical institutes, are attracting young men destined to become directors of large industrial enterprises, while the faculties of Letters are becoming the resort of students interested in the economic and social reorganizations of the time, and also of young men and women preparing to be school inspectors and professors at Normal Schools.

ATTENDANCE AND GRANTS.

The increased attendance at Higher Primary Schools and Practical Schools of Commerce and Industry accounts partly for the decline in the total enrolment in Secondary Schools for boys as between 187,402 in 1901 and 161,388 in 1909—the whole of this decline of 26,000, with the exception of 8,000, being in private schools. The State Lyceums and Colleges increased during that period from 88,202 to 96,830.

The total appropriations by the Government for the maintenance of Secondary Schools for Boys in 1909 was \$4,157,900. In the five years (1906–10) the total increase in the appropriations for Secondary Schools for Boys was \$557,110, which was used chiefly for increases in salaries of professors and assistants.

Public Secondary Schools for Girls are administered separately and are under different regulations as regards programmes and standards. The total enrolment of girls in 1908 in public secondary institutions was 34,671. The appropriation for these institutions in 1909 was \$671,115.

The total amount allowed by the State for Secondary Schools for both boys and girls, including the additional appropriation applicable to both, or else intended for special purposes, was \$5,993,235. The State appropriation for current expenses of Universities in 1909 was \$2,897,888. The Higher Normal School, which has been consolidated with the University of Paris, received a separate appropriation in that year of \$53,720.

SECTION 7: HIGHER EDUCATION.

The greatest progress has been made in the domain of Higher Education. Everywhere faculties were poor and in a most wretchedly neglected condition; the sciences and medicine especially lacked laboratories for study and research. The equipment, particularly at Paris, was in such a deplorable state that in 1873 Mr. Jules Simon, then Minister of Public Instruction, acknowledged before the learned societies that he did not venture to show to foreign visitors either the Sorbonne (University) or the School of Medicine, because they made him so ashamed of France. Transformations have been wrought since that time, and many edifices constructed. They are all roomy and abundantly equipped with up-to-date apparatus in all branches. About 84,000,000 francs have been devoted to the improvement of Higher Education, and it is estimated that a further sum of one half this amount will be required to complete its equipment.

In 1876 there were 625 professorships of higher instruction; now there are over 1,200. The number of students in 1875 was 9,963; now there are 40,767.

CHAPTER XXXI: ELEMENTARY TECHNICAL INSTRUCTION.

Provision is made for instruction and training in three types or kinds of schools.—

1. National Vocational Schools coming under the law of 1880. (Schools of Manual Apprenticeship);
2. Practical Schools of Commerce and Industry;
3. Free (Private) Schools of Technical Instruction, not classified under the preceding categories.

SECTION 1: NATIONAL VOCATIONAL SCHOOLS OR SCHOOLS OF MANUAL APPRENTICESHIP.

The law of December 11, 1880, conferred the name "Schools of Manual Apprenticeship" on the public or private schools which were founded with a view to developing the necessary dexterity and technical knowledge among young persons who intend to enter manual trades.

It places these schools on a similar basis to the Supplementary Courses, the Higher Primary Schools, and the private schools, both primary and vocational.

The promoters of this law were prompted by the well founded statement that in France the economic value of workmen in almost all the trade bodies had a downward tendency. This regrettable state of affairs, which might have been productive of the most serious consequences to the national industries, was due in great part to the fact that apprenticeship had practically ceased to exist in France.

Efforts were made to remedy this state of affairs by promoting in industrial centres the establishment, for each branch of industry, of special vocational schools that might replace and even improve upon the old-time apprenticeship system. The usefulness of such establishments was no longer in doubt, and many manufacturing towns, recognizing this fact, had taken a praiseworthy initiative in this direction.

The State on its part founded on July 9, 1886, at Vierzon (Cher) a "National School of Higher Primary Education and of Vocational Instruction Preparatory to Apprenticeship." This was intended to serve as a model for institutions of the same kind to be founded under the law of 1880. The following year the National Schools of d'Armentieres (Nord) and Voiron (Isere) were founded upon the same model. Finally, in 1898, the State bought the Livet institution at Nantes, in order to turn it into a fourth National Vocational School.

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NEW TYPES OF SCHOOLS.

At the outset, under the law of 1880, the vocational public schools were dependent for their general instruction on the Department of Public Instruction, and for the technical instruction on the Department of Commerce and Industry. A special provision was inserted into the finance bill of 1882 modifying this, and deciding that Higher Primary Schools whose teaching is mainly industrial or commercial should be placed under the exclusive control of the Minister of Commerce. These schools received the name of "Practical Schools of Commerce and Industry."

In order to classify the vocational schools, a commission composed of representatives of the two Ministries received instructions to arrange a basis for legislation as to their position. There has been a tendency, which appears to be productive of good results, for the number of vocational schools coming under the jurisdiction of the Department of Commerce to increase from year to year, and only a few schools now remain subject to the law of 1880.

As they were at first placed under the provisions of this law, it seemed as if, from the nature of their teaching, the National Professional (Vocational) Schools should come under the category provided for by the law of 1892. But the opposition of the higher officials of the Department of Public Instruction had first to be overcome, and it was only in 1900 (by the budget of April 13) that the credits for the maintenance of these schools were transferred from the budget of Public Instruction to that of Commerce and Industry.

ATTITUDE OF GOVERNMENT.

The 25th anniversary of the National Professional (Vocational) School at Vierzon was celebrated at the time of the visit of a section of our Commission, and the following extract from an address on that occasion by Mr. Coubya, Minister of Commerce and Industry, will give a good idea of the attitude of the Government:—

In a country like ours, where the distinctive feature of production is taste and elegance, it is indispensable to have good artisans. Hence it is necessary that from adolescence onwards our future workers shall receive a training which will enable them to maintain and extend the renown of French industry.

Does it not also serve the interests of the worker himself to put him in the way of improving his social position by the skilful practice of his trade? Hitherto only the elite have been able to benefit by the advantages of technical education, which must be extended more and more to the requirements of the most varying trades and districts. The Minister of Commerce purposes, with the concurrence of the Government, to direct it in this decentralizing spirit, whilst subordinating it to the higher principle of the unity of national education.

This great problem is occupying the attention of the Minister of Public Instruction and the Minister of Commerce, and they are co-operating in its solution.

Whilst it is the duty of the Minister of Public Instruction to see that those children of the people who show special aptitude for theoretical studies should be afforded the opportunity of the highest grade of secondary and higher education, the Minister of Commerce must see especially to those children who show aptitude for practical work. For these, the supplementary courses and practical and professional schools will give instruction in the synthesis of the subjects learnt at the common school, and put into their hands that indispensable tool, a trade, one of those beautiful and simple French trades which, in their ingenious technique, are as noble as a profession, and which, elevated by the perfecting of science and art, will be in the future, as in the past, the pride of our artisans and the enrichment of our country.

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PRACTICAL AIM OF COURSES.

The school at Vierzon was opened in 1886; those at Voiron and Armentieres in 1887; and that at Nantes (Livet school) in 1898.

These schools aim to turn out educated workmen, qualified to become overseers and especially foremen. They also prepare students for the examination for admission into the Schools of Arts and Trades and for other technical schools. For instance, the school at Voiron prepares some students for the Central School at Lyons.

The instruction is free, but in addition to day scholars each school receives full boarders and day boarders.

The usual course of study is four years, but only three for those who intend to enter other technical schools.

The instruction is theoretical and practical. The former comprises moral and civic instruction, writing, French, history, geography, elements of hygiene, arithmetic, algebra, geometry, trigonometry, accounting, general and industrial chemistry, mechanics, technology, ornamental drawing, and geometrical industrial drawing. Foreign languages are optional. Practical instruction comprises iron and woodworking, with special instruction adapted to local industries; at Vierzon iron and ceramic industries; at Voiron weaving, linen and silk industries; at Armentieres iron, molding, and weaving. Free students may be admitted to the courses in professional weaving at these two latter schools, which possess experimental laboratories for textiles available for the public.

A preparatory section was established in 1906 at the school at Voiron; entrance by competitive examination. Since 1908 this school has possessed an experimental laboratory and special workshops for electrotechnics.

The school at Nantes, now installed in old buildings, will soon take possession of premises expropriated from the grand seminary.

COUNCILS AND COMMITTEES.

At each National School there are: (1) a governing council which regulates all questions relating to welfare of pupils, satisfies itself by monthly visits that the establishment is well kept, and makes suggestions to the Minister as to any improvements to be made; (2) a welfare committee, composed of leading men of the locality chosen from among manufacturers or merchants, which helps to find positions for the most deserving pupils on completion of their studies, and takes particular care of the holders of scholarships; also investigates methods of bringing the instruction into harmony with the requirements of the various industries of the locality; (3) a council of professors, presided over by the director of the institution, which attends to classifying the pupils, enrolling names on the roll of honor, and admitting pupils into the higher division; proposes additions or exclusions when occasion requires; draws up (in order of merit) a list of candidates for State scholarships; gives advice about prolongations, promotions and suspensions; and in case of serious misconduct of pupils sits as a disciplinary council and suggests penalties.

ENTRANCE EXAMINATION.

Admission into these schools is by competition. Candidates must be French citizens, at least 12 and not over 15 years of age on October 1st of that year; and must be enrolled at the prefecture of their Department before July 10th. No exception is made as to age. Candidates must furnish certificate of birth, medical certificate that they have no disease, especially of a scrofulous or contagious nature, and that they can safely devote themselves to manual work; certificate of revaccination; statement of their conduct marks and work during the previous academic year; and a note showing the school which they wish to attend.

The examinations, which are identical for the whole of France, are held in July on the same days and at the same hours, in the chief towns of the Departments and at the headquarters of each school. They consist of written compositions only, e. g.; (1) dictation of 15 lines, followed by some questions in grammar; (2) French composition on a simple subject; (3) a page of writing; (4) an arithmetical problem within the limits of the program of the higher course of the elementary primary schools; (5) questions on the history of France since 1610, and on geography.

The examinations are marked from 0 to 20, and candidates must obtain at least $2\frac{2}{5}$ of the maximum in order to appear on the list from which nominations are made until the available vacancies are filled.

The number of pupils admitted in 1908 was as follows:

Schools.	Full Boarders.	Day Scholars.	Total.
Armentieres.....	82	15	97
Nantes.....	50	43	93
Vierzon.....	80	25	105
Voiron.....	75	17	92

STUDIES, EXAMINATIONS AND FINAL DIPLOMA.

The studies are divided between theoretical instruction and shop work. The manual work is limited to 3 hours daily in the first year, 4 in the second, and 5 in the third and fourth.

Parents receive at the end of each month a statement of marks for the courses and practical work, and also a quarterly bulletin.

Classification of students in each division and on the roll of honor takes place quarterly. The final classification is made at the end of the year according to the promotion examinations, and pupils may be admitted to higher division, or compelled to remain two years in the same class, or may be excluded.

Admission in 3rd year to the special section, preparatory to the National Schools of Arts and Trades and other technical schools of the same grade, requires an average of 10 marks for drawing and shop work, no individual mark being less than 6.

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Towards the end of the third year a certificate of fitness to receive the certificate of practical industrial studies is given to those pupils who, after a special examination, are preparing for the competition for admission to the Schools of Arts and Trades.

Final examinations for 4th year pupils, held at each school before a special commission, bear on all subjects of the program. Written examinations consist of a French composition, one paper each in mathematics, mechanics, physics, chemistry; oral examinations comprise mathematics, mechanics, physical sciences, the questions being drawn by lot, and fifteen minutes preparation allowed for each. The professional examination consists of drawing, technology and manual work.

Those pupils are admitted who have obtained at the examinations a general average equal to at least 11 out of 20, no individual average being less than 6; but for drawing and manual work the average must not be less than 10. A diploma is granted by the Minister to those pupils who have passed the final examinations. Within two years after leaving school those who failed to obtain the diploma may be admitted to another examination for diplomas.

In 1908 diplomas were granted as follows: Armentieres 36, Nantes 19, Vierzon 24, Voiron 16.

FEES, SCHOLARSHIPS, EXPENSES,

The price of board in these schools is fixed as follows: (figures denote francs, the first being for full boarders, the second for half boarders):—1st year, 500,250; 2nd year, 550,275; 3rd and 4th years, normal section, 550,275; 3rd and 4th years, special sections, 600,300. Reduction is made from above rates of 1/8th for two students from same family, and 1/6th for three.

Complete outfit to the value of 200 francs must be supplied when the pupil enters, and renewed by the family, cost of renewal for the 2nd and 3rd years being estimated at 50 francs a year. In exceptional cases the Minister may grant reductions in the cost of the outfit.

The school fee at Armentieres, for lectures in weaving, is 200 francs a year. but on request, young persons in poor circumstances may be excused all fees other than those for academic supplies, estimated at 25 francs.

A certain number of full or partial scholarships, maintained by the State, are conferred every year on enrolled candidates, after the entrance examination in the first half of the list; others are reserved for pupils who have finished their first or their second year studies, and the position of whose families justifies assistance from the State. Applications must be accompanied by the tax papers of the petitioner, as well as a statement of information certified by the mayor as being honest and correct, showing the resources and expenses of the family. Scholarships are granted after consultation with the council of professors. Every scholarship pupil who at the end of the school year falls below the first half of his division loses the benefits of his scholarship.

Various Departments maintain scholarships in the National Vocational Schools, which they confer on candidates who have passed satisfactory examinations but have been unable to win national scholarships.

SECTION 2: PRACTICAL SCHOOLS OF COMMERCE AND INDUSTRY.

The essential object of these schools is to train recruits for industrial and commercial undertakings, and is the same as that of National Vocational Schools. They fit young persons for commercial pursuits or industries, enabling them in a short time to become overseers or foremen of workshops, and also prepare students for the entrance examinations of the Schools of Art and Trades; but they are not to sacrifice their apprenticeship properly so called.

The instruction is free. Pupils cannot be admitted before the full age of 12. Those under 13 must produce certificate of primary studies or prove compliance with the requirements of the school by passing an entrance examination. When candidates outnumber vacancies, admission is by competition.

HOW ESTABLISHED AND MANAGED.

The following is a summary of the law of 1893:—

These schools may be established by a Department or Commune, or combination of both. A general or municipal council wishing to establish such a school must prepare a special estimate of expense of opening and maintaining it, at the charge of the Department or Commune, and the available resources, and must undertake to support it for 5 years, in accordance with the law of 1889. The establishment of the school must be approved by the Minister of Commerce and Industry, to whom plans in detail of its construction, equipment and furnishing must be submitted, and he may grant funds up to one-fourth of total cost.

The staff shall comprise a director not under 25 years of age, and an adequate number of assistants and practical instructors not under 21. All must be French and hold certificates recognized by the Ministry for their respective positions. All appointments are made by the Minister, assisted by an Advisory Board from a list of 3 persons submitted by the Mayor of the Commune or Prefect of the Department, as the case may be.

There shall be a certain number of Superintendents of Apprenticeship on the staff, as required, these being appointed by the Prefect or the Mayor, and their salary fixed by the municipal or departmental council, in consultation with the director. These teachers are not entitled to pensions, except under specified conditions.

The Staff is divided into 4 classes:—directors or directresses, receiving from 2,500 to 4,000 francs; professors, practical instructors and workshop-superintendents, receiving from 1,500 to 3,000 francs; and assistants (male and female) from 1,200 to 2,400 francs per annum, together with lodging allowance according to the local conditions.

Expenses of maintenance are borne by the State, the Departments, or the Communes, according to the law of 1889. The Ministry of Commerce

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and Industry may make grants to Departments or Communes, as prescribed, for the purchase and maintenance of equipment, furniture and appliances.

Scholarships to cover boarding are awarded by the Ministry on competitive examination. The course includes (1) commercial and industrial training, both theoretical and practical; (2) supplementary primary education. Proportion of time allotted to each is decided according to local requirements, the time-table being fixed by the Council of Improvement of each school. If the school has both industrial and commercial sections a special program must be drawn up for each in subjects peculiar to that section, and for the two sections together in common subjects. Certificates are awarded on graduation.

COUNCILS OF IMPROVEMENT.

Each school has a Council of Improvement, consisting of the Prefect or Mayor; the Inspector of Commercial or Industrial Education (or both if the school has both sections); 4 members nominated by the general (departmental) or municipal council, at least two of whom must be or must have been engaged in industry or commerce; and one member appointed by the Ministry of Commerce (or two in the case of two sections). In the latter case the two members must be or must have been engaged in commerce and in industry respectively. In the case of Girls' Schools, two of the four nominated members must be women.

The Director or Directress attends all meetings of the Council, except when the annual report is being discussed.

The Council's duties are to give advice on expenditure, visit the school at least once a month to see that everything is in order, attend the graduation exercises, and compose the annual report to be submitted to the Minister through the Prefect.

In the case of municipal schools, mayors are instructed to interest themselves in placing pupils, especially scholarship holders, on leaving school, and to give advice on matters submitted to them by the Minister or Prefect.

Such schools are inspected by the Inspector-General of Technical Instruction, the Departmental Inspector of commercial or industrial education, or by the Departmental Inspectress.

The entrance requirement for *Normal Sections* comprises mathematics and geometry, French literature, French history, geography, and one foreign language. In the *Industrial Section*, drawing and manual training are required.

SCHOOL PROGRAMS FOR THE SECTIONS.

The teaching programs in these schools are very extensive documents which can scarcely be summarized, hence only the subjects taught and time allotted to each will be mentioned. These typical programs are not compulsory but are only intended to guide controlling boards in the preparation of the special programs at each school, which should be adapted to the needs of local trades and industries.

COMMERCIAL SECTION (Boys).

Class Hours Per Week.

1st year. 2nd year. 3rd year.

	1st year.	2nd year.	3rd year.
Ethics.....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
History.....	1	1	..
Hygiene.....	..	..	1*
Drawing.....	1	2	..
French.....	6	3	2†
Physics and Chemistry.....	3	$1\frac{1}{2}$	..
Arithmetic and Algebra and Calculation.....	3	3	..
Commercial Legislation.....	..	1	1
Elements of Commercial Economy.....	..	..	1
Geography.....	1	1	3
Merchandise.....	$1\frac{1}{2}$	3	3
Accounting and Commerce.....	6	3	3
Practical Exercises (Monography and Commercial Office Work).....	..	6	6
Penmanship and Typewriting.....	3	2	2
English or German.....	6	6	6
Another language.....	3	3	3
Supplementary Professional Instruction for the pupils' future calling or for the commercial needs of the locality.....	..	..	$5\frac{1}{2}$
Inspected Studies.....	9	9	9

*During the last three months.

†During the last three months one hour of French is replaced by one hour of hygiene.

This time table was made up by taking as a basis the one-hour class, except as regards the teaching of Physics, Chemistry and Industrial Electricity, which may necessitate experiments of a certain duration and for which the one and a half hour class has been arranged.

The Workshop or Drawing sessions are of at least 2 hours' duration.

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COMMERCIAL SECTION (Girls.)

Class Hours Per Week.

1st year. 2nd year. 3rd year.

I. Commercial Instruction:

Commerce, Accounting and Bookkeeping.....	4½	4½	4½
Foreign Language.....	4½	4½	4½
Arithmetic and Algebra.....	3	3	3
Geography.....	1½	3	3
Writing and Penmanship.....	3	1½	1½
Chemistry and Merchandise .....	..	1½	1½
Legislation.....	..	..	3
Commercial Economy.....	..	..	1½
Total hours.....	16½	18	22½

II. General Instruction:

Ethics.....	..	1½	1½
French Language.....	4½	3	3
Drawing.....	1½	1½	1½
History.....	1½	1½	1½
Natural History and Hygiene.....	..	1½	..
Geometry.....	..	1½	1½
Rudiments of Physics.....	1½	..	..
Domestic Economy.....	..	..	1½
Plain Sewing and Cutting out.....	3	3	3
Total hours.....	12	13½	13½

<i>III. Studies.....</i>	4½	4½	3
Grand totals.....	33	36	39

INDUSTRIAL SECTION (Boys).

Class Hours Per Week.

	1st year.	2nd year.	3rd year. 1st period.	3 last months.
Ethics.....	1½	1½	1½	..
French.....	3	2	1	..
History and Geography.....	2	1	..	..
Rudiments of Industrial Economy and legis- lation for the working classes.....	..	..	1	..
Arithmetic and Algebraic Calculus.....	3	2	..	..
Geometry.....	3	2	..	..
Physics and Chemistry.....	3	1½	..	..
Rudiments of Mechanics.....	..	..	2	..
Rudiments of Industrial Electricity.....	..	..	1½	..
Supplementary theoretical instruction ap- plied according to the trades.....	..	..	2	3
Drawings and descriptive rudiments.....	6	7	7	7
Practical work.....	20	23½	28½	38
Technology.....	1½	1½	1½	..
Supervised studies.....	6	6	6	2
Total hours.....	48	48	51	51

This table was prepared by taking as a basis the one-hour class except as regards the teaching of physics, chemistry and mechanics, which may necessitate experiments or manipulations of a certain duration and for which the class of one and a half hours was arranged.

INDUSTRIAL SECTION (Girls).

Class Hours Per Week.

1st year. 2nd year. 3rd year.

I. Industrial Instruction.

Workshops.....	24	27	30
Drawing.....	6	3	3
Total hours.....	30	30	33

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II. General Instruction.

French Language.....	3	3	1½
History.....	1½	1½	..
Geography.....	1½	1½	..
Natural History and Hygiene.....	..	1½	1½
Domestic Economy.....	..	..	1½
Physics.....	1½	1½	..
Chemistry.....	..	..	1½
Arithmetic.....	1½	1½	..
Geometry.....	..	1½	1½
Accounting.....	..	..	1½
Ethics.....	..	1	1
Writing.....	1	..	..
Plain Sewing and Cutting out.....	3	1½	1½
Total hours.....	13	14½	11½

III. Studies.

	6	6	6
Grand totals.....	49	50½	50½

CHAPTER XXXII: TYPICAL SCHOOLS OUTSIDE PARIS.

SECTION 1: VAUCANSON SCHOOL, GRENOBLE.

This Practical School of Commerce and Industry for Boys was visited by a section of our Commission. It is an important school, situated near the beautiful promenade of Ile Verte. Its course of study is 4 years; or 5 years for pupils in the division of industrial electricity and chemistry established in 1899.

The Preparatory Year comprises four divisions, pupils being admitted who hold the certificate of studies or have passed an equivalent examination.

The subjects of instruction are French, history, geography, writing, mathematics, physics and chemistry, natural history, linear drawing, ornamental drawing, and modern languages (9 hours a week of English, German or Italian, at choice.)

After this first year pupils are sent to one of the two following divisions according to their tastes, the occupation for which they are intended, and the wishes of parents.

THE INDUSTRIAL SECTION.

The Industrial Section prepares especially for immediate entrance into technical occupations. There is a special division to prepare pupils for the schools of arts and trades.

Subjects of instruction:—French language, history, geography, mathematics, physics and chemistry, natural history and hygiene, modern languages (English, German or Italian, at choice), industrial drawing, mechanics, industrial electricity, chemical manipulations, industrial economy, land surveying, levelling, topographic drawing, and work in the workshop.

The vast workshops comprise:—forging, adjusting, metal turning, wood turning, electricity and machines.

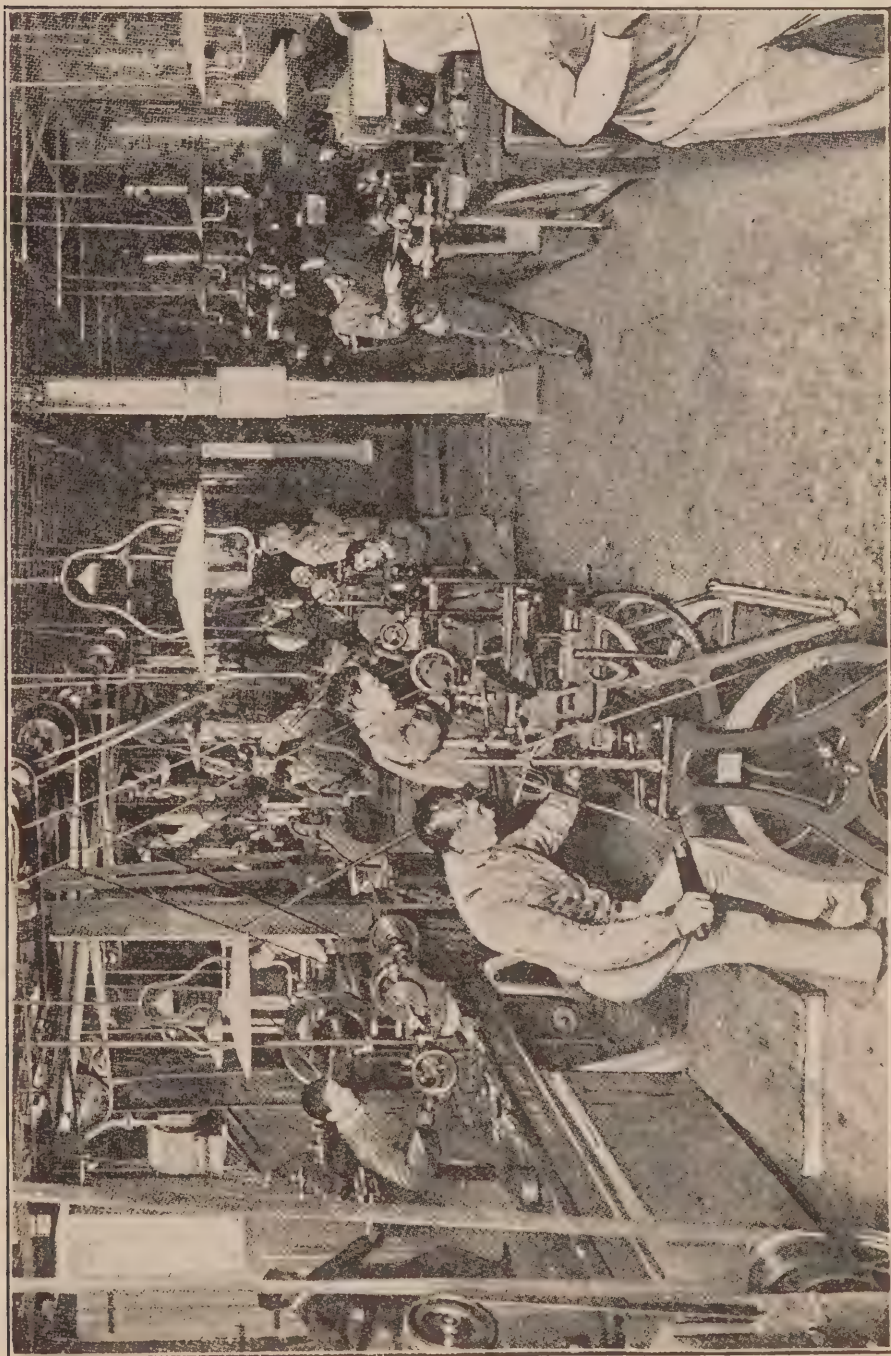
When the pupils have acquired a sufficient general technical education they may be trained in the operation of the principal machines and motors employed in manufacturing (the steam engine, gas motor, turbine, etc). They devote themselves specially to the construction and management of electrical machines.

Certificate of industrial studies is awarded on completion of course.

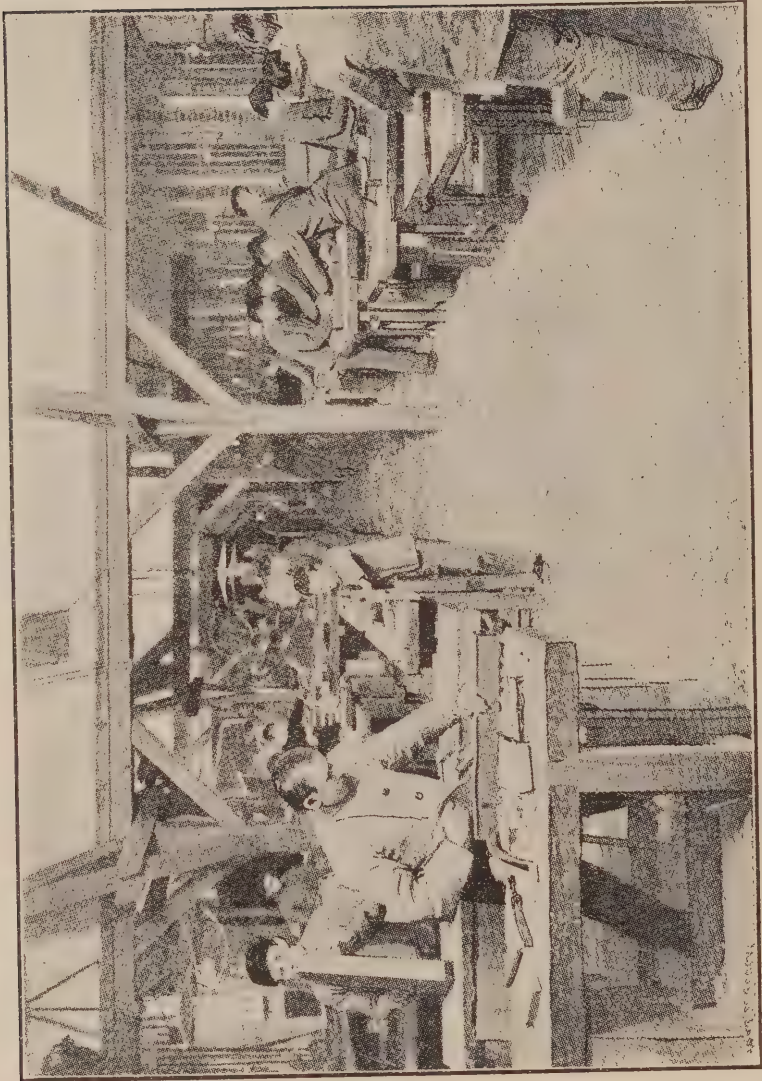
THE COMMERCIAL SECTION.

The Commercial section provides instruction in French language, history, commercial geography, legislation, commercial economy, commerce,

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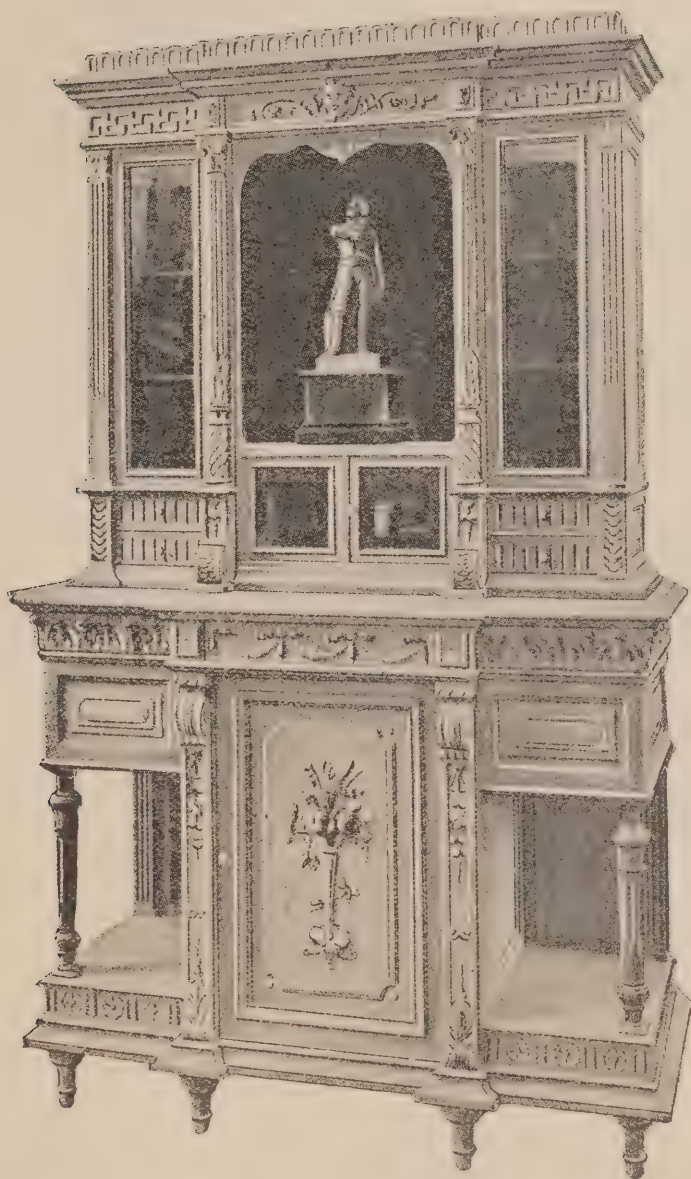


FITTERS' WORKSHOP: VAUCANSON SCHOOL, GRENOBLE.

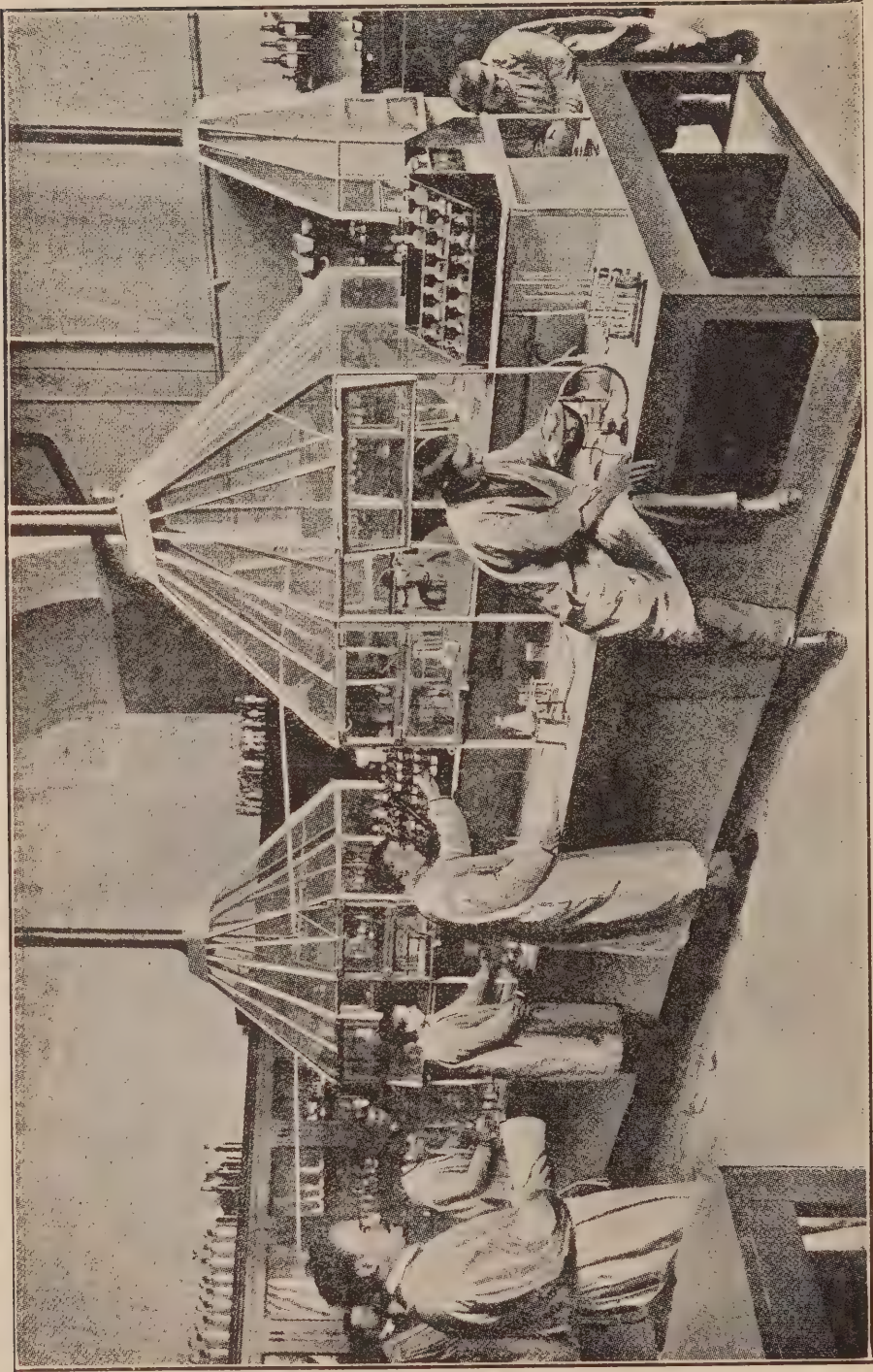


CARPENTERS' WORKSHOP: VAUCANSON SCHOOL.

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SPECIMEN OF CABINETWORK BY STUDENTS OF VAUCANSON SCHOOL.



CHEMICAL LABORATORY: VAUCANSON SCHOOL, GRENOBLE.

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accounting, bookkeeping, commercial office work, penmanship, typewriting, shorthand, two modern languages, (English, German or Italian, at choice), mathematics, physics, chemistry, merchandise, natural history and hygiene, and ornamental drawing.

Certificate of commercial studies is awarded on completion of course.

THE CHEMISTRY SECTION.

In the Electrical and Industrial Chemistry section the instruction comprises:—(1) a course on all matters concerning the industrial production and utilization of electric energy; (2) practical work in the laboratory and workshop with reference to the ordinary electric measures, and including the handling and laying of electric current apparatus; (3) exercises in preparing plans and estimates of electric installations of all kinds; (4) visits to factories and electric installations; (5) exercises in machine management; (6) chemical manipulations and analyses. This section prepares students for the Electro-technic Institute of Grenoble and for the Higher School of Electricity at Paris.

The Association of ex-pupils, in conjunction with the Council of Improvement, helps to find positions for pupils, and also grants scholarships to the school. The State, the Department and the City also maintain numerous scholarships. A committee of patronage grants redeemable subsidies to the best students on the completion of their studies to enable them to remain one year abroad.

Fees: with board, 580 francs; half board 290 francs.

GLOVE-MAKING SECTION.

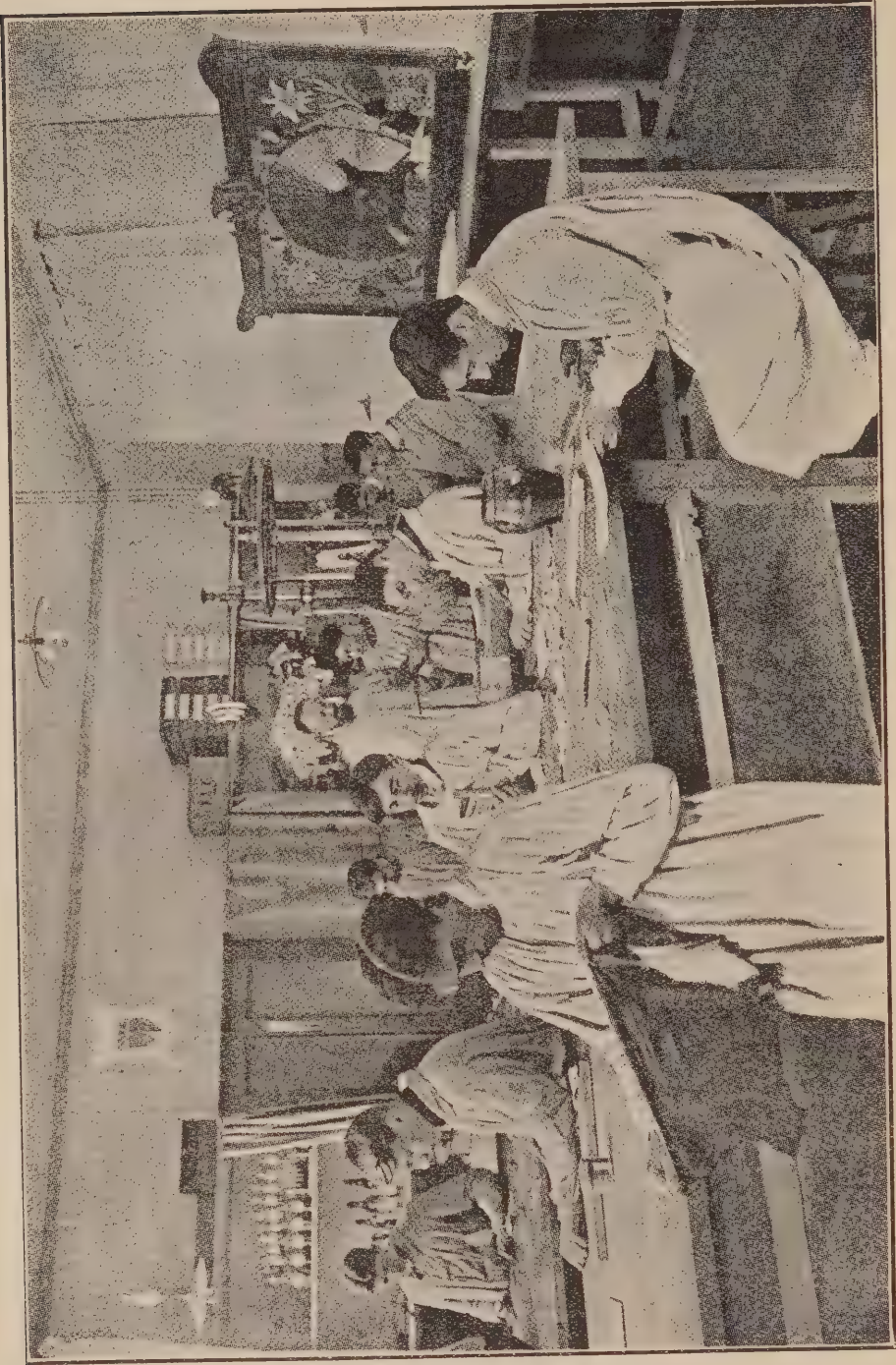
In 1910 the Syndical Board of Glove Manufacturers of Grenoble, distressed by the stationary condition of the glove industry, established a glove-making school, with the object of increasing the value of the product by raising the intellectual and practical standard of the agents of production.

The aim of this school is to discover practical means of training workers for the glove-making industry and allied trades, qualified by their general education, for the management of factories; competent to become salesmen or travellers by the development of their commercial talents; and by their knowledge of the details of their trade to be utilized in the technical part of manufacturing.

In order to accomplish this triple object the instruction must bear on general commercial and technical subjects.

The school is a manufactory which buys and sells, possessing the permanency of method of any commercial organization, and not treated merely as an accessory. From this results the circumstance that the school is in competition with the manufacturers who supply it with its necessary working funds.

This section is managed by a technical and administrative committee, composed of the mayor or his delegate; president, departmental inspector of technical commercial instruction; director of the school; president or one delegate



GLOVE-MAKING SECTION: VAUCANSON SCHOOL, GRENOBLE.

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of the Syndical Board of Glove Manufacturers; one glove manufacturer and one glove workman nominated by the Prefect; and one glove manufacturer and one glove workman nominated by the Mayor.

THE COURSE AND TIME TABLE.

The certificate of primary studies is necessary to enter the Vaucanson school. During the preparatory year, the first year, and the first quarter of the second year, the future pupils of the glove-making section must take the courses common to all young men who are aiming at commercial professions.

The course is four years, from 12 to 16 years of age, graded thus:—(1) *Preparatory year*,—predominance of general instruction; modern languages an important feature. (2) *First year*,—predominance of commercial instruction; considerable time left for general instruction. (3) *Second year*,—commercial instruction and practical technical instruction. (4) *Third year*,—predominance of practical exercises; continuation of commercial instruction.

The following is a time-table per week for each year:

<i>General Instruction.</i>	Prepara- tory year	1st Year	2nd Year		3rd Year
	hrs.	hrs.	1st quarter	2nd and 3rd quarter	hrs.
French.....	7	6	4½	1½	
History.....	1½	1	1	—	
Geography.....	1½	—	—	—	
Arithmetic.....	4½	—	—	—	
Geometry.....	1½	1	1	—	
Sciences.....	3	2	2	—	
Drawing.....	4½	1½	1½	—	
Writing.....	1	—	—	—	
<i>Commercial Instruction.</i>					
1st Language (English or German)	6	6	6	6	6
2nd “ “ “	3	3	3	3	3
Commercial Arithmetic.....	—	3	3	3	1½
Commercial Geography.....	—	1½	3	3	—
Merchandise.....	—	1½	—	—	—
Commerce and Accounting.....	—	6	6	3	3
Caligraphy.....	—	1	1	—	—
Stenography and Typewriting....	—	2	2	2	—
<i>Technical Instruction.</i>					
Technology and Chemical Man- ipulations.....	—	—	—	20	30
Practical Exercises.....				8	6
Studies.....	14½	14	12½	8	6
Total hours.....	48	49½	49½	49½	49½

SECTION 2: HIGHER PRIMARY COMMERCIAL AND INDUSTRIAL SCHOOL FOR BOYS, NANCY.

This school at 64 Grande rue, founded by the City in 1835, has 430 pupils. It furnishes higher and vocational primary instruction to young persons who are going to be apprentices or follow administrative, industrial, or commercial pursuits; or who are preparing for government schools, for which a knowledge of the ancient languages is not necessary. Nearly all the pupils belong to the laboring classes, who know how to appreciate the advantages of supplementary instruction, and deny themselves for the sake of educating their children.

Pupils are taken at about the age of 13. Nearly all have first been through the Primary School, and having obtained their certificate of studies, have taken a higher course of one year in their first school, from which they received a special diploma.

The course comprises 4 years. There is first general teaching, which has for its object to prepare young men for social life.

The first year consists of four parallel classes comprising general instruction as follows:—morals; French language; lectures on fine literary works; history and geography; civic instruction and elements of social economy; applied arithmetic; algebra and geometry; rapid calculation; physics and natural sciences; hygiene; geometrical drawing and art drawing; singing and gymnastics. A few hours only are given to trade teaching, modelling, manual training and accounting.

DIFFERENTIATION OF COURSES.

From the second year the program differentiates according to sections, and becomes more preparatory for future trades.

1. *Sections of general instruction*, which take candidates for secondary studies, Normal Schools and various offices (post-office, railway, army, etc.), develop and complete the general program of the first year.

2. *Commercial Sections*, where the future employees of commerce are grouped together, add to the general program a more complete study of German and English, commercial geography, correspondence, accounting, book-keeping, stenography, typewriting, elements of commercial and industrial law, and a course in political economy.

3. *Industrial sections*, subdivided into two groups, accept: (1) future apprentices first in the school and then in the workshops; and (2) those young men who wish to continue their studies in secondary or superior technical schools (arts and trade, master miners, electro-technical institutes, mechanical, chemical, dental, etc.) or even others, who are preparing themselves for professions where mathematics and drawing are especially needed (bridges and roadways, draughtsmen in railway offices, etc.) In the industrial sections the principal subjects are mathematics, mechanics, industrial electricity, drawing, technology, industrial chemistry and manual work.

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The large workshops with electric plants and machine tools permit of great development in industrial education.

The budget of the schools in 1909 was 75,160 francs, of which about 43,000 came from the State and 36,000 from the City.

PART-TIME SCHOOL: The school has a course for improvement (part-time school) of two sections, industrial and commercial, organized for apprentices and employees of commerce and industry. The industrial classes are more particularly attended by superintendents, workmen and designers from mechanical and electrical industries.

The courses are three years in both sections. They are open all the year round, three mornings a week, November to July, from 6.30 to 7.45 a.m. Time is taken partly from the working day, which is supposed to begin at 7 a. m.

In the part-time school there are 158 students—75 in the industrial course and 85 in the commercial. It is partly supported by donations from industrial houses, banking establishments and large stores in the City. The total amount in 1909-10 from these sources was 4,700 francs, the expenses being 4,000 francs.

SECTION 3: EASTERN VOCATIONAL SCHOOL FOR BOYS, NANCY,

This is a very important free (private) school, at 29 rue des Jardinières, with an attendance of about 450 pupils, whom it prepares for all callings that do not entail the study of the classic languages. There are primary classes and a vocational school proper. The lower primary course is under the care of a female teacher.

The qualifications for admission are,—age 13, and the possession of the certificate of the primary studies, or an equivalent preparation as revealed by an entrance examination.

The vocational course is ordinarily 4 years, but there is a 5th for pupils who wish to complete their technical education and take the courses of the Electro-technic Institute and of the Chemical Institute of the faculty of sciences.

Besides general instruction the pupils learn forging, fitting of iron, modelling, and foundry and electrical molding. They are trained to operate machine tools, steam engines, and the dynamo-electrical engines which light the school. A cupola and a bronze furnace have been installed in the establishment. Five dynamos of from 25 to 50 ampères, and also a battery of accumulators operate in the workshops. The work done in the shops is partly intended for manufacturing.

A distinct class is devoted to preparation for the Schools of Arts and Trades.

MECHANICAL, COMMERCIAL AND OTHER SECTIONS.

1. *A 2 years' Course for Mechanics* is designed to train quartermasters, pupil-mechanics for the crews of the fleet, machinists and fitters for private industries. It is intended especially for young persons who are unable or do not wish to enter the Schools of Arts and Trades.

2. *In the Commercial Section* the course is 2 years, and the program is the same as the 1st year of the Higher Commercial Schools. This school of commerce comprises real commercial counting-houses where pupils learn accounting.

The section is subsidized by the Department of Commerce, and has courses in accounts current, commercial correspondence, technology, industrial accounting, exchange and arbitration, and finance. Diplomas are granted at the end of the course for the Higher Commercial School at Nancy.

3. *In the Electrical Section* there are courses in applied mechanics and resistance of materials, machine tools, boilers, industrial physics, and industrial accounting; and pupils take the course in industrial electricity of the University with practical work.

4. *In the Section of Spinning and Weaving* the Course comprises applied mechanics and resistance of materials; industrial electricity (University Course); machine tools; boilers; industrial physics; practical work in spinning and weaving, adjusting and mechanics, industrial drawing and sketching; a course in dyeing and dressing (that of the Chemical Institute); course in decorative composition applied to the textile industry.

EXPENSES, SCHOLARSHIPS, ETC.

Board is 800 francs for pupils of the 5th year; 700 for 4th year, and for 2nd year of commercial section; 620 for pupils in other classes; half board 350 francs. Washing costs 35 francs. Day school annual fee is 80, 100, 120, 150, 180, or 200 francs according to the class; for Supervised Day-School 30 francs additional.

Annual fees for working in the shops, 30 francs; for chemical manipulations 50 francs. The manipulations and workshop are optional for the four first years. Special terms are made for teachers' sons.

The Eastern Railway Company gives 15 scholarships for sons of employees; 4 are given by the Department, and from 20 to 30 by the State. Subsidies to pupils have been contributed by various societies of Alsace-Lorraine and by the Association of former pupils.

SECTION 4: PRACTICAL INDUSTRIAL SCHOOL FOR BOYS, ST. ETIENNE.

This is a well organized day school, well equipped with tools. During the last 5 years it attained its maximum number of pupils, 460. The following trades are taught:— Adjusting, industrial electricity, gunsmithery, forging, joinery and patternmaking, weaving and textile fibres, modelling and sculpture.

The qualifications for admission are,—age 13, and the possession of the certificate of primary studies, or an equivalent preparation as revealed by an entrance examination.

The course of studies occupies 4 years, a considerable portion of this time being spent in the drawing room. All pupils work from sketches or drawings executed by themselves. In the third year they make out estimates of their principal work.

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In the preparatory year pupils attend all the workshops, and specialize from the beginning of the first year.

The machinists go in turn to the forge workshop to learn how to forge their own tools, and also do a little molding with the pupil modellers.

In the third year the pupils take a course in industrial electricity.

Those in the Mechanical Section who wish to follow the trade of electrician take a fourth year of studies devoted exclusively to electricity following a special elementary but sufficiently complete course, and construct various kinds of apparatus and machines in the workshops after having first drawn the plans from data furnished by the professor. They are also trained in the laboratory in the measurement of electrical quantities, and in the mounting and management of the commonest forms of apparatus, and also make many machine tests.

Pupils in the Weaving Section receive special lessons in accounting, legislation and commercial geography, and also study one modern language.

Preparation is given for the School of Arts and Trades.

Since 1900 the Syndical Board of the St. Etienne gun manufacturers has granted, to each third year pupil in the gunsmithery division, a prize varying from 50 to 100 francs at the end of the school year, as an encouragement.

SECTION 5: PRACTICAL COMMERCIAL AND INDUSTRIAL SCHOOL FOR GIRLS, ST. ETIENNE.

Girls holding primary education certificate enter here at the age of 12, otherwise at 13, when they must pass the entrance examination. Besides general education in the two divisions the programs comprise:—

Commercial Division:—accounting and book-keeping, commercial correspondence and writing, merchandise, commercial geography, legislation, political economy, English, shorthand, typewriting.

Industrial Division:—technical and practical instruction in manual work. Workshop pupils devote the first year to the study of sewing proper and are not specialized. They are trained to assist in all practical ways, for they know how to sew thoroughly well. They specialize in the second year, choosing (1) cutting, assembling, and making up women's clothing; (2) millinery; (3) the care of linen; (4) embroidery, white and for furniture; (5) ironing, starching and cloth cleaning.

There are 400 pupils, about 200 in each section, with 12 workshop instructresses, and 13 professors for other branches.

The course is generally three years, but when girls are rather young they may stay another year. On leaving they are likely to go into workshops and businesses. Young girls from the commercial section are very easily placed as assistant book-keepers or stenographers and typists. They spend 8 hours daily in class.

COURSE IN INDUSTRIAL DRAWING.

All pupils take a course in industrial drawing adapted to their chosen specialty, having in public schools learned the rudiments of drawing and designing.

There is a general competition in drawing amongst girls from all the schools in France, under the direction of the Minister of Commerce and Industry, and all the drawings are sent to Paris, where special mention is given to those that are good.

Drawing begins with straight lines, curves and angles, then passes on to composition and drawing from natural objects; geometric composition, rectangular, circular, loops and straight lines. The work is original; nothing is copied. Pupils do perspective, object drawing, and geometrical lines from nature. As crayon work is quicker than brush, always uniform, and utilizes very pretty colours, crayons are used.

In the second year there is a course in designing, which does not include clay modelling, as it is not thought practical. There is also composition and execution of embroidery, eyelet work, and braiding.

In the third year they specialise in actual flowers and composition from flowers, flowers conventionalised into elaborate designs; application to furniture, tapestries; Egyptian, Greek, and other styles of decoration; application to garments; designs on dresses made to scale; study of anemone and application to collars of ladies' dresses.

In the fourth year they study the history of costume,—Egyptian, Greek and Roman—and its development during various centuries, with illustrations. Students have to originate every part of the design the subject being a tailored serge suit.

LAUNDRY AND SEWING.

In the laundry the girls are taught washing and ironing as part of their home education, bringing articles from home, the work being done by groups of six.

Sewing in the first year comprises elementary exercises in coloured thread; straight and curved lines; then the application of the various stitches in the elementary lesson in composition. They mix colours according to their own taste, and when wrong are criticised and told what colours would match.

SHOP WORK, EXHIBITIONS, ETC.

In the first year they go to the shops, so as to be able to select when they want to specialise. For instance, those who specialise in embroidery have 25 hours of shop work in both the second and third years; in the first year only 22 hours.

All the compositions are made by the students themselves, and the articles are made from their own drawing. The teacher confers with the professor of drawing, so that what they do in the drawing class is executed in the workshop. After the year is over they exhibit their work, which is sold to the public, the proceeds being distributed among the pupils.

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We saw fine special embroidery made with narrow crimped ribbon manufactured at the silk works in the town. There are preparatory exercises for this kind of embroidery, which produces beautiful effects in raised work by rolling the narrow ribbon.

EXTENSION WORK.

The school has an outline of the course for the dressmaking and hat-trimming sections, as furnished to all the schools in France under the direction of the Minister of Commerce and Industry. This outline is sent to the professors, and the pupils have to work from sealed orders.

The third year students prepare their competition articles to be judged for the certificate. The subject of composition is given by a furnisher of St. Etienne, a member of the committee. The subject is worked out in thin cheap gauze, and the finished work in serge. The dresses are given to the girls when they leave school.

The Commercial Department conducts correspondence with various towns in France, England, Ireland and Holland through business houses conducted by students of other schools, the transactions involving trial balances, balance sheets, etc.

The correspondence is in longhand and typewriting; copies of all letters are kept on file; cheques and postal orders are issued, etc. Four of the girls go to England to stay for a year and return to situations.

SECTION 6: LA MARTINIÈRE SCHOOL FOR BOYS,
LYONS.

This school, at 9 rue des Augustins, was founded through a legacy left by Major-General Martin, who was born at Lyons in 1735 and died at Lucknow, British India, in 1800. The legacy, originally 700,000 francs, remained untouched until 1826, when the capitalized interest had reached 1,700,000 francs. Later on 515,000 francs were realized. Including the boys' and girls' schools, La Martinière has an estate and collections valued at from 1,200,000 francs to 1,500,000 francs, and an income of about 280,000 francs.

The school, opened in 1826, has been installed since 1833 in its present quarters, a former monastery of the Augustin Friars. It was organised by Mr. Tabareau, a former pupil of the Polytechnic School, aided afterwards by Mr. Dupasquier, a professor of drawing, who invented for this school special methods of teaching. These were the cause of its prosperity, and still constitute its originality.

It is administered under the authority and oversight of the Prefect by a free (private) commission whose members are nominated by the municipal council and definitely appointed by the Minister of Commerce.

La Martinière is a vocational school devoted to the study of the sciences and arts applied to industry and commerce. Whilst specialising pupils during the latter years of their studies, it aims especially to fit them to succeed in any

profession, and to confer on them the advantages of a developed intellect, habits of scientific reasoning, a comparatively wide education, and particularly enthusiasm for their work. This latter quality and the abolition of the "foot of the class" are the result of the special methods of teaching here, especially of Mr. Tabareau's method, of which the Commission witnessed an exhibition.

COURSES OF STUDIES.

The school is free, and receives only day-scholars at least 13 years of age. The entrance examinations comprise:—*Mathematics*: enumeration, the four rules applied to whole numbers, to decimal fractions, and to ordinary fractions, the metric system, problems. *Grammar*: dictation chosen from a good author, which serves also to test the writing and orthography of the pupils. *History and Geography of France*.

La Martinière has 600 pupils. Every year it receives about 300 aged 13 from the Primary School. There is also a preparatory year for pupils who enter at 12 years of age. The duration of the course is 3 years after preparatory year.

The Preparatory year:—Reading with explanation, grammar, history and geography, writing, arithmetic, mathematics, drawing and manual work.

First year:—The instruction is general, comprising grammar, history and geography, writing, mathematics, physics, chemistry, drawing, manual work.

Second year:—French, history and geography, writing, mathematics, land-surveying, accounting, physics, chemistry, and drawing. English and weaving for the commercial section; and workshops for the section on civil engineering.

At the beginning of the second year the pupils choose the section to which they wish to belong, and are slightly specialised in preparation for the third year, when they are divided into two distinct sections (1) on commerce and weaving, (2) on civil engineering and electricity.

Third year (commerce and weaving):—French and commercial correspondence, accounting, office work, penmanship, weaving, English, commercial geography, the study of merchandise, chemistry, commercial legislation, and political economy.

Third year (civil engineering and electricity):—pure mathematics, descriptive geometry, industrial mechanics, civil construction, electricity, manipulations of electricity, machine design, design of civil constructions, chemistry, industrial legislation, manual workshops, visits to workshops.

BADGE OF "CORPORAL," DIPLOMAS, ETC.

After the general closing, the badges and functions of "Corporal" are bestowed on the first pupils of each section. At the end of the third year of studies diplomas of the 1st and 2nd class are awarded to those pupils who have obtained sufficient marks, from 50 to 60 diplomas being granted every year.

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The final examinations are conducted by boards of examiners composed of persons not connected with the school—merchants, industrial employers, artists, and professors chosen from amongst the most competent persons in each specialty. The 1st class diploma in the section on civil engineering assists its possessor to enter the competition of the National Schools of Arts and Trades.

Pupils on leaving La Martinière generally obtain situations in business or at industrial work. There are always more positions offered by the employers on the school board than there are available pupils.

The heads of nearly all the large dyeing establishments at Lyons are former pupils of La Martinière, as are also a considerable portion of the large mechanical builders, and a great number of employers in business houses, in the silk trade or elsewhere.

For the last 80 years the school has rendered signal services to the commerce and industries of the south-eastern part of France.

SECTION 7: LA MARTINIÈRE SCHOOL FOR GIRLS, LYONS.

This school, at 20 rue Royale, founded in 1879, is under the same administration and management as the school for boys. It is governed directly by a sub-directress; is free, and receives only day-scholars at 12 years of age, on leaving the Primary School. It is a vocational school, intended to train girls of the working classes at Lyons, giving them at the same time a manual trade. The instruction is composed of one part theory, for all pupils, and each one must be apprenticed to a trade chosen by her parents from amongst those taught at the school.

For apprenticeship the pupils of the same division are divided into as many sections as there are different trades taught at the school. The trades taught are:—commerce, industrial drawing, placing of cards for silk manufacture, embroidery, sewing (gowns and ready-made clothes), stenography and typewriting. The manual workshops, where the apprenticeship is carried out, are organized industrially. All pupils, whichever trade they choose, learn sewing and ironing.

The ordinary course of general studies and apprenticeship is 3 years, but pupils who have completed 3 regular years of studies are admitted to the school workshops to perfect their apprenticeship, and under the direction of the professors execute work which has been ordered by private business houses; such pupils receive the entire pay for such work.

Diplomas are awarded to the best pupils in the various sections of apprenticeship after 3 years of study.

Satisfactory pupils are placed in positions as far as possible, through the school, and find positions very readily.

SECTION 8: COURSES FOR APPRENTICES AND ADULTS.

HOW COURSES MAY BE ESTABLISHED.

It is not considered right that youths should receive no intellectual training between their leaving school at about 12 years of age and entrance into the army. It was suggested that popular instruction in the form of courses might with advantage in many cases be replaced by instruction in the form of lectures, which are more vivid and are rendered more interesting accompanied by lantern views; hence the State by the edict of January 11, 1895, endeavoured to revive learning among adults by encouraging, through subsidies, the formation of courses and lectures. This edict provides,—

(1) That courses may be established by the Prefect at the request of the Municipal Council and on the advice of the Inspector of the Academy;

(2) That in classes for adults or apprentices the instruction may bear on the subjects of elementary and higher education as established by the rules and regulations, or may comprise theoretical and practical courses specially adapted to local needs;

(3) That adult courses may comprise classes for the illiterate, special courses for young persons who wish to complete their education, and lectures and readings for all;

(4) That two or more distinct sections may be established, according to the age and degree of education of the pupils;

(5) That no public schoolmaster can be compelled to conduct a class for adults;

(6) That the courses and lectures may be entrusted to any person who desires on the proposal of the Mayor, approved by the Prefect, and on the advice of the Inspector of the Academy;

(7) That the program of such courses and lectures be submitted to said inspector when the request is made;

(8) That the commune assume the expenses of heating and lighting;

(9) That the State subsidy, granted on the proposal of the Prefect, shall not exceed one half of the cost which these courses entail;

(10) That not only State subsidies, but grants of books and educational apparatus, may be allowed to educational associations established to organize such courses for adults;

(11) That when the commune assumes the expenses of the course, the terms of remuneration be arranged by agreement between the commune and the Director of the course.

CAMPAIGN OF AGITATION.

Since 1895 popular opinion in favor of undertakings intended to assure the future of public education had produced a salutary agitation throughout the country. Several educational congresses took up the question, that at Havre being particularly impressive, both from the number of delegates and the fulness of the

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debates. Its Secretary was Mr. Edouard Petit, a man of action, who always fought stubbornly for the education of youth, for which he laid the foundation in a successful pamphlet entitled "From the School to the Regiment". When he became Inspector-General of Public Instruction he continued his propaganda in favour of post-academic work, the inspection of which had been given into his charge. Every year he travels all over France arousing the apathetic, awakening enthusiasm, and communicating to all some of the fine flame which animates him in favor of public education.

THE INSPECTOR-GENERAL'S REPORT.

In his report on public education in 1907-8 Mr. Petit shows that the work is progressing but that, as in the day-school, the evening school is worth only what the teacher is worth, and that attendance is secured only if useful and interesting lessons are given. He notes the following developments among others:—

(1) The establishment, through the initiative of the Prefect, of elementary courses for the illiterate in the Canton of Rochechouart held in 7 isolated farms during 5 months, attended by 200 male and female peasants from 14 to 50 years of age;

(2) Multiplication of courses for illiterate soldiers;

(3) Increasing success of public reading;

(4) Development of good fellowship;

(5) Ever increasing activity of Associations of former pupils who have found their bearings—those for boys towards preparatory military education and rifle shooting; those for girls towards household education;

(6) Increase in the number of friendly associations for young girls.

Mr. Petit notes that the courses for adults are still growing. Since 1894-5, the period when they began to rise from their long term of decadence, their number has rapidly increased. From the original, 8,288 courses they reached the figure of 48,565 in 1907-8—30,271 being for boys and 18,294 for girls. The above refers only to public courses given by male and female teachers; but to make it complete there must be added about 6,000 courses given by the great educational societies, boards of trade, committees of employers and workmen, etc. In large cities the courses for adults are numerous, but they appeal less to the illiterate than to those who need supplementary and especially vocational education.

Mr. Petit lays particular stress upon the subject of school attendance. He would like to see the curriculum extended to the 15th year as in Switzerland, and also to have continuation instruction made compulsory.

He argues, from the crisis through which apprenticeship is passing, that the school must be the necessary complement of the workshop, and that it is a matter of urgency to impose upon the heads of business enterprises the legal obligation of sending their apprentices to attend the supplementary classes.

CHAPTER XXXIII: THE VOCATIONAL SCHOOLS OF PARIS.

SECTION 1: INTRODUCTORY.*

The Vocational Schools in Paris are a part of that complex and comprehensive organism, the French educational system, which directs or influences every grade of instruction and every kind of educational agency from the primary school to the University, and from the free lecture to the Prix-de-Rome. Their origin may be traced to conditions in the social and industrial life of the French people.

The characteristic feature of the trade-organizations under the old regime of the eighteenth century was the Corporation. It comprised (1) masters or master-workmen, who could open a shop, or work on their own account, (2) journeymen, and (3) apprentices. The latter were compelled to pass a most laborious novitiate of four or five years, but at the end of it they possessed all the secrets of the trade. The master was allowed but one apprentice at a time, to whom he was bound by obligations from which he could not free himself, and which, as a rule, he was anxious to fulfil.

At the head of each Corporation was a Board of Control, composed of four or six members selected from among the masters, which exercised a very strict and often despotic supervision over everything pertaining to the Corporation. Such an organization had its defects. The initiative of the artisan was paralyzed by a set of regulations that extended to the minutest details of his work. Moreover, not every one who wished was allowed to work. Work itself was a privilege. But on the other hand, the Corporation maintained a high standard in the craft. Before being able to obtain the right and title of a journeyman, the apprentice had to prove that he was fully acquainted with every detail of his profession.

In 1776 Turgot, a minister fond of reforms, suppressed the Wardenships of Boards of Control, and the charters of the Corporations, and proclaimed absolute freedom of work. The Corporations reappeared after his day, but only for a short time, for the National Constituent Assembly put Turgot's decree again in force. The law of 1791 read:

From the first of April next, every citizen shall be at liberty to take up any profession, art or trade that he likes. He merely has to secure a license and comply with the regulations.

EQUAL RIGHTS FOR ALL.

This law substituted equal rights for all in place of privilege for the few, but it dealt a blow to craftsmanship, from which it has never recovered. There

*Condensed from Henry Turner Bailey, Editor "School Arts Magazine", Boston, supplemented by the observations of the Commission.

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were many who foresaw the consequences of the law and raised their voices in protest. Even Marat, in his newspaper "The Friend of the People" passionately defended the Corporations.

At various times under the Consulate, the Empire and the Restoration there was something like a reaction in favor of the Corporations, but all movements towards re-establishment were unsuccessful. Turgot's doctrine prevailed.

A return to the medieval system would be impossible to-day, although many thoughtful Frenchmen still regret the passing of the Corporations. An impartial student of the history of French craftsmanship must admit that from the time of the Revolution there was a steady decline in the industries of France. French products no longer held undisputed supremacy. Manufacturers had to reckon with foreign competition. Rival industries beyond the borders of France began to encroach upon home industries. It became necessary to produce a great deal, quickly and cheaply, lest the markets should be closed to the products of French industry. This ushered in the division of labour to an extreme degree. The workman became a specialist. He knew but a small part of his trade. Of every process but one he was ignorant. His hand, instinctively and with a purely mechanical effort, made always one and the same detail. Ingenuity was not required, invention was at a discount, research was dead. While this unfortunate condition may have resulted in part from general economic causes, many of the keenest French thinkers attributed it to the decay of the apprenticeship system.

BETTER TRAINING DEMANDED.

From all quarters an irresistible movement of opinion began to assert itself in favour of better training for craftsmanship. In Paris a society was formed to establish apprenticeships in the manufacture of opera glasses, and another society attempted to improve the manufacture of wall paper. Wealthy individuals established private vocational schools, and others gave scholarships in them. Every thoughtful patriot felt that something must be done to rehabilitate French industries.

Meanwhile the City Government awakened to the need of discovering something to fill the educational void left by the disappearance of the Corporations. Its first expedient, in 1845, was the bank-book plan, providing for free instruction in certain approved private institutions. This plan proved to be unsatisfactory and in 1855 it was abolished and a system of scholarships was substituted, but this plan proved hardly more satisfactory than the first.

As a further encouragement to better vocational training, the City of Paris founded evening classes devoted especially to drawing.

But all these were mere palliatives. The remedy was still to be found. After the fall of the Empire, the question of vocational instruction in Paris was one of the first considered by the newly elected Municipal Assembly.

A Bill prepared by M. Greard, Director of Primary Instruction, was laid before this Municipal Assembly in 1872, calling for the creation of a school of apprentices in the iron and woodworking trades. M. Greard claimed that the

placing of the child with manufacturers upon his leaving the primary schools—a placing made hurriedly, without discrimination, and merely with a view toward immediate wage-earning—was disastrous in its outcome. He described the life at the workshop; the distrust of the workman who sees in the apprentice of today the workman who will crowd him out tomorrow; the indifference of the foreman whose mind is absorbed in affairs of his own. He called it an intermittent apprenticeship without guidance or method, limited to acquiring a knowledge of some fragment of a profession or trade. He described vividly the errands out-of-doors forced upon the young boy, the dangers of the street, and those not less formidable of the shop, and concludes with these words:

NEED FOR VOCATIONAL SCHOOLS.

Thus, from whatever point of view the general conditions of an apprenticeship in Paris are considered, it does not meet the needs of the child. Want of foresight on the part of the boy's parents, indifference on the part of the patrons or masters, impotence of the law, everything, seems to conspire against the apprentice. Even the development of commercial competition and the progress of industrial mechanics turn out to be to his detriment. Every one agrees that generally the shop, that ought to serve to develop all the forces of the child, wears out his body before nature has finished the making of it, puts his mind to sleep just as the school had begun to awaken it, stains his imagination, corrupts his heart, and poisons whatever spirit of craftsmanship or love of his trade he may have had. This deplorable school in individual morals dwarfs the man in the apprentice, the citizen in the workman, and does not even produce a good mechanic.

This is an authoritative statement as to the character of apprenticeship in Paris, before the establishment of the Vocational Schools.

A vote was secured to establish, as an experiment and possibly as a type, a school of apprenticeship for the iron-working and wood-working trades. "This act," says M. Lavergne, 'was of the utmost importance; it meant a new standpoint, a new starting-point for professional instruction in the municipality of Paris. It was a step into the unknown, the unexplored. It was a venture involving some risk.' The future of French industries would be determined by the outcome.

PRIMARILY TRADE SCHOOLS.

As soon as the project had been agreed upon, work was commenced. The result was the establishment of the famous Diderot School, the object of which was the training of well-instructed and skilful workmen, capable of earning their living on leaving the school. Thus began the era of municipal activity in regard to technical instruction, which spread to Lyons and many other cities.

The Professional (Vocational) School is therefore primarily a trade school, a school designed as a substitute for the old apprenticeship system. Since 1880 various sorts of these schools after the plan of the Diderot School have been established by the city of Paris. These now number 15—7 for boys and 8 for girls.

MANAGEMENT.

Each of the Professional (Vocational) Schools is supervised by a Committee of Inspection nominated by the municipal council. It is composed of members of that assembly, manufacturers, merchants of recognized professional ability, a representative of the Ministry of Commerce, and a representative of the Ministry of Instruction.

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The powers of the Committee are not inexorably fixed by law. Their duties are primarily administrative and financial, but inevitably they become advisory as well, for upon each Committee are men who are able to give valuable advice on technical matters. Each has therefore all the liberty possible. Its power extends even to the modifying of school programs in accordance with new needs, or the fluctuations of taste and fashion. It prepares the annual budget, audits the accounts, and in short has charge of everything pertaining to the organization and management of the school.

But the Administration does not divest itself of all powers of control. It sometimes moderates the enthusiasm of the Committee, asserts its authority if rules are ignored or broken, and calls the Committee to account if expenses exceed appropriations.

The Committee of Inspection, by virtue of the very manner in which it is made up, is worthy of all confidence. In its zeal for the success of its school it may try to push ahead too rapidly, but its boldness is a corrective of the tendencies of the Administration towards conservatism and procrastination. The combined action of the two results in bringing about a healthy normal growth in every vocational school in the city.

Each school is organized with Officers of Administration and a Staff of Instructors.

In the schools for boys, the Officers of Administration are a director, a general superintendent, supervisors in varying numbers, and an accountant. In the schools for girls, the Officers of Administration are a lady director, who must be present at every session of the school, and an accountant.

TWO GROUPS OF INSTRUCTORS.

The Staff of Instructors includes two groups: one giving general instruction, and another giving technical instruction. General instruction is entrusted to teachers of the standing of those employed in the Higher Elementary Schools of the city. But each school employs a specialist in literature and science.

The technical instruction is in the hands of thoroughly trained men and women of recognized ability, each in his own craft or trade, and holding a municipal certificate to teach, won through competitive examinations.

As a rule, the mornings are devoted largely to the general courses, and the afternoons to the technical courses, or the mornings to lectures, and the afternoons to studio work.

The walls of the rooms are hung with the most successful works of graduates of the school, as well as with photographs and casts of masterpieces. In some cases the walls and windows have permanent decorations made by the pupils.

INTERESTING TEACHING METHODS.

The methods of instruction are as direct and as thoroughly correlated as possible. In the History of Art, for example, the instructor while lecturing draws from memory upon the board the illustrations he requires, no matter how complex. The pupils take notes in pencil (which are afterwards corrected and

copied in ink) and copy his drawings as he makes them. The board is of gro und glass, in some cases, and of a middle grey colour. Upon this the instructor draws first in outline, indicating the geometric and perspective construction; upon these constructional lines he completes the drawing, using white chalk in the lights, charcoal in the darks, and coloured chalk wherever it will help to delineate the original object. The pupils have notebooks with leaves of grey paper upon which they work with black, white, and coloured pencils, following always the instructor step by step. The pupils thus receive instruction in the history of art, in the method of teaching, in the method of drawing, and have practice in drawing at the same time. The instructors are thoroughly trained masters, with the history of art, perspective, anatomy, costume, or whatever they teach, not only at their tongues' ends but at their fingers' ends. Their blackboard drawings are models.

The work required of the pupils may be characterized as disciplinary and practical. Drawing with the point precedes water colour; water colour on dry paper with the utmost precision of touch precedes water colour on moist paper with blended hues. Truthful perspective, correct proportions, detailed graphic description, faithful colouring—these are the requirements, these are the essentials. Originality, artistic effect, clever technique—these may come later if the pupil has genius. The applications are ever in the realm of the immediately useful. In an exhibit of the Bernard Palissy School there were original designs for program covers, book-plates, letter-paper stamps, hand mirrors, dressing tables and their furnishings, desks, inkstands, penholders, blotter-pads, cups and saucers, flower-pots, bowls, utensils for the fireplace, folding screens, etc. In the girls' school, Rue d'Abbeville, designs for fans, for the decoration of cups, saucers, plates, vases, for doilies, towels, embroideries of all sorts, cuffs, collars, silk things of many kinds, miniatures on ivory and glass.

PUPILS' WORK JUDGED BY EXPERTS.

Pupils are promoted from year to year upon the recommendation of teachers, and the attainment of excellence in work. At the end of the course, however, certificates are granted not upon the testimony of teachers, nor according to the judgment of any group of school officials, but according to the decision of a competent jury of professional people not connected with the school, engaged in business, artists, printers, potters, milliners, decorators, dressmakers, manufacturers, whose judgment is recognized everywhere as authoritative. For example, the successful pupil must produce a brooch acceptable to the best jewellers in the city, or a costume approved by the best modistes, in workmanship the equal of the goods sold in the best shops.

The City awards not only certificates and diplomas but prizes for excellence in results, and these prizes are often in the form of appropriate books, beautifully bound in red morocco, and stamped with the seal of the city and an inscription beginning with the valued words "From the City of Paris."

The maintenance of these 15 Vocational Schools costs the City of Paris annually over 1,750,000 francs, or \$350,000.

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MR. LAVERGNE'S ANSWER TO CRITICS.

Of course there are critics who doubt the real utility of these establishments built and maintained at such expense, and who declare that the results do not justify the outlay. M. Lavergne says:—

There is nothing in the present situation that would justify these fears or explain these discouragements.

The Estienne School, the School of Physics and Chemistry, the Schools of Drawing, Germain Pilon, and Bernard Palissy, the Diderot School, and the Boulle School are excellent nurseries from which a great number of artists, physicists, chemists and workmen come forth, capable of earning a livelihood immediately, well acquainted with all parts of their trade or craft. Having come in contact with the real and practical work of the shop, they are able in a short time to become themselves foremen and directors.

Among the pupils terminating their studies in this establishment every year, there are some who go elsewhere to complete their professional education; others enter the school of Fine Arts, where they are speedily classified among the best students. In 1898 the first and second great prizes offered by the Government were obtained by former students of the Estienne school. It is true these are instances of exceptional success obtained by choice students endowed with remarkable aptitudes, but they nevertheless bear witness to the great value of the instruction given in that establishment.

As to the pupils in physics and chemistry, they easily find positions properly remunerative in private industries. Some find employment as chemists to the Government, in the department of Railroads, or in the Custom House.

It is proper to add, that the situation shows everywhere a tendency to improve from year to year, as any one may discover for himself by reading the reports of the Committee of Inspection, accompanying their annual estimates for appropriations. The most confirmed of pessimists will find therein reasons for believing in the vitality and usefulness of the professional (vocational) schools for boys. There is just as much confidence in the future of the professional (vocational) schools for girls, although at first sight the results seem less favourable.

The proportion of young girls practising (after leaving the school) the trade in which they have been apprentices, is not very high. On the other hand, there are many girls whose situation is not known, or who go back to their families. Those who find a position in the workshops have in the beginning only a very moderate salary. But the facts are that well-trained girls after a short time have their salaries increased. Their work speedily becomes remunerative. Most pupils leave the school when they are 18 years old. At that age one is not supposed to have "arrived." The statistics of the last year are (everything considered) rather satisfactory. Without doubt, in the professional schools for girls, as well as in those for boys, quite a number of students do not go to the end of their studies. They withdraw after their second year of apprenticeship, sometimes even after the first year. The reason for this state of things is complex. But usually the cause is the impossibility of the family making any farther sacrifice. The children must work. The city of Paris, it is true, maintains scholarships, but they are few in number, and the amount of each is small. In many cases the scholarships provide but an insufficient relief for the families. The scholarships ought to be increased in amount to meet the needs of young girls whose parents are in straitened circumstances.

Moreover, the girls at the end of their apprenticeship sometimes find difficulty in getting a position. They need advice and protection. The guardianship of the school must extend beyond the school. The Committee of Inspection, and the lady directors, do not lose sight of the young girls when they leave the school, but endeavour to make easy their first steps, and to assist them in every way possible.

But let us not fail to notice that if a certain number of pupils, after once finishing their apprenticeship, simply go back to their families, they nevertheless derive an advantage from what they learned during the three or four years spent in the vocational schools. They have acquired manual dexterity and taste. They know how to sew, embroider, make a dress, a hat, in fact they can do everything that is necessary in a well-to-do household.

We are convinced that the condition of our Parisian vocational schools (already good) will be but improved in the future. At all events the contingency of retrogression cannot be thought of.

Let us not touch what exists, except to amend or complete what needs to be amended or completed. Everywhere these schools are respected; they are appreciated by the common people. They are helping to solve the very grave question of adequate apprenticeship. They have had a strong influence in restoring to France her prestige in the artistic handicrafts.

SECTION 2: EXTENT OF THE PROVISIONS.

While the Paris Vocational Schools are nominally included in the State system of public instruction, they are in fact under the supervision and control of the Municipality, which jealously guards its independence. The schools are practically supported by the City, and so far from being subject to Ministerial regulations, furnish the model for national procedure.

In Paris a child enters the Infant School at about 3 years of age, and the Primary School at 6. Here begins a regular course of manual training, which in the case of boys is generally conducted in a school workshop, and in the case of girls comprises sewing and cutting of garments, millinery and other feminine industries.

The city possesses 19 Primary Schools for boys which give supplementary general or commercial courses, 11 in which there are Supplementary Schools of vocational instruction (in iron and wood); 29 Primary Schools for girls with supplementary general courses; 16 for instruction in domestic economy and manual training; and 7 for commercial instruction.

The first Manual Training School in Paris was opened during the siege of Paris in 1872, to provide for the numerous children left without occupation, as well as for teachers who had to withdraw from the suburbs of the city. This school survived the siege, and under the advice of Mr. Salicis, then Inspector of Public Instruction, whose name it bears, it was taken over by the city as an experimental Manual Training School. It offers the most complete illustration of Manual Training in elementary grades, although this has now become a common feature of the elementary schools of the capital.

HIGHER PRIMARY SCHOOLS.

As soon as the Certificate of Primary Studies is gained, at about 12 years of age (sometimes 11), the pupil is eligible for a Higher Primary School or a "Professional" (Vocational) School, or may leave school altogether.

Higher Primary education is represented by 5 important schools for boys and 2 for girls.

FOR BOYS.

Schools providing Higher Primary instruction are designed for young persons who are going to enter business or banks, industries or industrial arts, public or private offices, and vocational schools that do not require classical studies. They even lead to the bachelor's degree, to the Central School, or to the courses preparatory to the day schools of the Schools of Mining, Bridges and Highways.

These schools as a rule take only day boarders, who are admitted free. Those who can pay are furnished the noon meal for a trifling sum ; others receive meals free.

Pupils enter on an examination open to pupils of private as well as public schools. Candidates must have been within the following age limits on October

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I of the year of examination: 1st year, 12 to 15; 2nd year, 13 to 16; 3rd year, 14 to 17. There is no exception as to age limit. The ordinary course is 3 years; then the pupils must be examined for final certificate of Higher Primary studies.

No pupil is allowed to pass from the 1st to 2nd year, or from the 2nd to 3rd year, unless he has proved by positions and examination that he has profited by his courses.

The 3rd year class has two sections: commercial and industrial. In the latter, greater importance is attached to mathematics, physics, and drawing; in the former, to the applications of arithmetic and algebra to commercial and banking operations, modern languages, commercial geography, penmanship, accounting, stenography, and typewriting.

A 4th or supplementary year was opened for pupils holding the certificate of Higher Primary studies who show particular aptitude for the sciences, and they receive more extensive and special instruction to enable them to compete for the great professional schools.

By Ministerial decree these schools are allowed a certain amount of liberty in fixing their programmes. For the first three years they follow the programmes of the Departments as a basis for teaching, but these programmes, as well as time tables, may be modified according to the existence either of a 4th year of studies, or of special sections which prepare pupils for definite careers. The 4th year programme, and also that of special sections, is made out for each school by the director or directress, after consulting the professors.

What gives a distinctive character and a special value to the instruction given in the Higher Primary Schools is the large number of special professors.

FOR GIRLS.

These schools are 2 in number: the Sophie-Germain school, which was opened in 1882; and the Edgar-Quinet school, which was opened in 1892.

The duration of the general studies is 3 years; but there is a 4th year, in which the pupils are prepared according to the object they have in view.

Candidates may compete for entrance, either in the 1st, the 2nd, or the 3rd year of studies. All that has been mentioned with reference to the competition for boys (enrolments, date and nature of tests, etc.), maintenance scholarships, and students from the suburbs, applies to the girls.

The instruction is free. Only day scholars are received. The pupils remain at school from 8.30 to 11.30 a.m., and from 1.30 to 4.30 p.m. They may bring their breakfast. At the Edgar-Quinet school there is a pupils' canteen where the pupils may procure, at reasonable rates, all or part of their meal. At the Sophie-Germain school the pupils may prepare their meal in the school kitchen.

Free optional supervised studies are held from 4.30 to 6 p.m.

PRIMARY TECHNICAL SCHOOLS.

Admission to the Primary Technical Schools for boys and Technical and Domestic Schools for girls is by competition. Instruction, apprenticeship-material

and all other requirements for study or work are free to candidates who are French and actually live in Paris or in the Department of the Seine; but students from suburban communes cannot be admitted by rank obtained in competition unless their communes agree to reimburse Paris 200 francs for each pupil.

Pupils spend the whole day at school. Those who can pay are furnished the noon meal and luncheon for a trifling sum; others receive them free. The general council grants breakfast scholarships to poor suburban children.

Pupils who have completed the full course (3 or 4 years, according to the school) receive a certificate of apprenticeship; but none is granted to those who leave school before the end of the apprenticeship. The most deserving pupils who have passed the final examinations may obtain prizes varying from 50 to 300 francs.

FOR BOYS.

Among the 7 Technical Schools for Boys in Paris, in addition to the *Ecole Diderot*, is the *Ecole Estienne* (bookmaking) called after a family of printers and publishers dating back to the commencement of the 16th century, its object being "to create artistic workmen qualified not only to carry out the work of ordinary typographers but also that of allied arts". The 5 remaining Technical Schools for Boys in Paris belonging to the primary class are the *Ecole Bernard Palissy*—virtually a School of Fine Arts applied to Industry; the *Germaine-Pilon School of Practical Drawing*; *Ecole Dorian*, a municipal orphanage which gives extended training in iron and woodwork; the School of Physics and Chemistry; and the *Ecole Boulle*, distinguished for furniture and cabinet-making.

The courses in these schools cover 3 to 4 years.

FOR GIRLS.

The 8 Municipal Technical Schools for Girls in Paris are devoted to what are commonly recognized as trades for women, such as tailoring, millinery, flower making, fine lingerie, etc. Girls over 12 are admitted after examination. These schools originated in 1856 with a philanthropic lady, *Elisa Lamonnier*, who founded a Society which carried them on until 1907, when they were taken over by the municipality of Paris. They are now continued upon the lines originally marked out, but with regard to the later developments of the industries to which the training is directed, in all of which decorative drawing and design form an essential feature. The training is elaborate and thorough on the art side, and also in the manipulation of the material which enters into the final product, such as tapestries, lace, ivory, precious metals, leather, copper, ceramics, etc.

CHAPTER XXXIV: TYPICAL SCHOOLS IN PARIS.

SECTION 1: BOULLE SCHOOL.

This School, for instruction in the arts and sciences applied to furniture industries, at 57 rue de Reuilly, was founded in 1882. It is intended to train skilful and educated artisans, capable of maintaining the traditions of taste and the superiority of French industry. Here the pupils serve an apprenticeship, and at the same time receive higher primary instruction suitable to their chosen trade. There are about 300 students.

The furniture produced in this School is so good that the furniture manufacturers of France have been able to secure legislation prohibiting its sale.

The competitive entrance examination comprises:—dictation, two arithmetical problems, and drawing at sight from a plaster cast, special stress being laid upon drawing.

FURNITURE MAKING AND METAL WORK.

There are two divisions—furniture-making and metal-work; 102 pupils are admitted yearly—60 in furniture, 42 in metal work.

In the *Furniture Section* are taught cabinet work, furniture, art joinery, elementary marquetry, upholstery, trimming and cutting, wood and stone carving applicable to ornament, to flowers and to the face, seat joinery for fancy seats with imitation wood and for wall brackets.

In the *Metal Section* the subjects are carving applicable to art bronzes, goldsmithing, jewelry, ironmongery, etc., mounting in the same applications, engraving of dies and matrices, on plate, jewelry, etc. (except that used in book work).

Turning of metals, plaster, ivory, etc, moulding and repairing are taught in both sections.

The theoretical instruction comprises geometry, technology, industrial economy, history of art, art drawing, modelling, painting in water colours, industrial drawing (cutting, assembling, mounting, and estimates) and composition in its most varied applications.

Candidates from the Department of the Seine are given the preference, provided they reach the required standard at the examinations. Pupils from the Provinces pay \$100 per year, and find their board and lodging. Lunch is furnished at school for 10 cents.

Candidates must be at least 13 and not over 16 on 1st October of year of enrollment; entrance examination is in June.

WORK OF PUPILS.

Apprenticeship at the school lasts 4 years, and all pupils spend a certain time in each workshop connected with their calling. Pupils passing final apprenticeship examination receive diplomas, tool outfits being given as final prizes to those most successful. To supplement their studies, pupils visit museums, palaces, factories, etc., for information of an esthetic or industrial character.

The equipment includes a collection of busts, casts and models; a forge for tempering; lathes for turning brass ornaments, etc. In the large workshop at the time of the Commission's visit were tables, sideboards, buffets, etc., in process, including a large table with marble top and beautifully carved legs representing human figures made entirely by the pupils. Pupils specialize; one boy may make chairs and nothing else. This is necessary in these days, as the trade has come to such a fine point. Some boys in the woodwork department were making door mouldings, and frames to hold ornamental panels, to be exhibited for competition. Marquetry is studied in various woods, involving different grains and colours. There is a show-room for fine finished work by the pupils, and some fine ornamental work by 4th year boys was exhibited.

Pupils have to make drawings of all articles before starting them in the workshop. In repoussé and raised metal work they make the design and clay model, then a plaster cast. The foundry work is done outside. Some boys were building up a model in clay on a wooden picture frame, so as to save deep wood-carving; they would have cast made from this. A clock frame in brass, composed and executed by pupils, was shown. The City of Paris presented one of these to a Grand Duchess who visited the school, and she in return presented a Russian stove made of tiles.

Stone carving is done in several kinds of stone as ornaments for decoration. This is for apprentices, and complementary to wood-carving, for exercise in the different materials.

For engraving, jewelry, etc., steel dies are made with which to stamp out key-hole frames, etc.

The boys work in models from 1st to 4th year. Carving in brass is the same as in wood. A portrait of Voltaire was being carved; ornamental pieces; gouging of brass; brazing and soldering brass for ornaments, made out of sheet metal. In the designing room the 4th year boys were making large designs of furniture and tapestry.

SPECIAL ROOMS AND FEATURES.

A special room was set aside for specimens of furniture made by the students in the "Art Nouveau" to contrast with conventional styles.

Pupils in the upholstery section were cutting out material, stuffing sofas, chairs, etc. Various designs are prepared on a movable frame, which is raised or lowered to show the artistic effect of the design.

Drawing is done in water colours to show effect of colour. Drapery is first studied by geometrical drawing, which is then imitated in the goods. There is a special professor for drapery.

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There is a lecture room for physics, projections, etc., and a Library.

A special feature is the study of Louis XIV and XV furniture. The pupils had made furniture in Louis XV style for the Turin Exhibition, and this is put up in the entrance to the school. In the industrial drawing class, pupils were studying tapestries in projects for a salon in the style of Louis XIV, to show the style of that epoch—about 1516.

Goods made in the school are not generally sold, though in the 1st and 2nd year pupils sometimes sell to parents or others the pieces they make. As a rule these are presented to the city authorities, museums, etc., so that strangers may see them.

In the Woodworking Department there was a special class for *Chairs*. Photographs of work of great masters are shown to familiarize pupils with the best styles, the specialty of this school being style.

There are free public evening courses for adults, in which the subjects are:—Art drawing (drawing at sight, ornament, plants, the living model, decorative arrangements and industrial applications); modelling; technical drawing or study and sketching the construction of furniture, with estimates of materials and net cost; jewelry applied to manufacturing, etc.

There is a Sunday morning course from October to May in water-colour painting applied to various industries.

SECTION 2: DIDEROT SCHOOL (BOYS).

ARTS OF METAL AND WOOD WORKING.

This school, at 60 Boulevard de la Villette, is intended to train educated workmen skilled in the art of metal and wood working. It gives vocational instruction to apprentices for one of the following trades: forging, metal turning, adjusting, locksmithery, precise mechanics, modelling, cabinet making, joinery boiler making, plumbing and electricity.

Competitors for admission must be at least 13 years of age and not over 17; must have certificate of primary studies; certificate of birth, residence and health; and must prove that they are of French nationality.

The competition consists of dictation, 3 problems in arithmetic, a problem in plane geometry, a composition on a technical subject of the program of primary teaching, and a free-hand sketch.

At the competition of 1908, 560 candidates offered themselves for the 120 places available.

The course of instruction lasts 3 years.

Pupils remain at school from 7.45 a.m. to 6 p.m. from November 1 to February 28; and from 6.45 a.m. to 6 p.m. from March 1 to October 31.

During the two first years the day consists of 5½ hours in the workshop and 3 hours of class; and in the 3rd year, 6 or 7 hours in the workshop and 2 hours of class. The two kinds of exercises are divided by intervals of rest devoted to meals and recreation. Many breakfast scholarships are granted to deserving pupils.

Parents of the candidates received must furnish at their own expense a uniform school cap and working costume.

Pupils receive both vocational and theoretical instruction. Workshops for vocational instruction comprises: forge, metal lathe, adjusting, instruments of precision, electricity, modelling, boiler making, joinery, locksmithery and plumbing. Subjects of theoretical instruction are: French language, history, geography, accounting, mathematics, technology, mechanics, physics, electricity, industrial and art drawing.

A certificate of apprenticeship is given after examination to the pupils who have completed their third year. Prizes are awarded to the best students.

SECTION 3: ESTIENNE SCHOOL.

PRINTING AND BOOKMAKING.

This School, at 18 Boulevard Auguste-Blanqui, is intended to train skilful workmen in book arts and industries.

Competitors for admission must be at least 13 years of age and not over 16, and must also have their certificates of studies. The competition in June comprises dictation, 2 problems in arithmetic (simple applications of the 4 rules for whole numbers, decimals, vulgar fractions, and the metric system), drawing at sight (simple ornament). From 70 to 80 pupils may be admitted every year by competition. The school also receives outside pupils at a fee ranging from \$80 to \$120, according to the year; \$200 being charged for pupils of foreign nationality.

The duration of studies is 4 years.

The pupils enter school at 8.30 a.m. and leave at 6 p.m. They may either bring their breakfast or have their breakfast and luncheon served by the canteen for 10c. Breakfast scholarships are granted to needy pupils.

Theoretical instruction is given in the forenoon, and technical from 1 to 6 p.m.

During the first four months of the 1st year, pupils pass in succession through all the school workshops; they are then distributed through the workshops where they are to serve their apprenticeship, and at the end of their 4th year certificates of apprenticeship are given, besides premiums, in order of merit, to pupils who have passed all the tests of the final examinations.

The Theoretical Instruction comprises: French language, history and geography, elements of mathematics, physical and natural sciences applied to the book industry, history of art, modelling, drawing at sight, decorative composition and industrial drawing, writing, gymnastic and military exercises.

The Technical Instruction includes:—typography, 4 trades, viz. type founding, composition and correction, printing by hand and by machine, stereotyping and electrotyping; lithography, 4 trades, viz. lithographic drawing and chromolithography, lithographic writing, stone engraving, lithographic printing. A supplementary course is given in reading and typographic composition from Greek, Russian and Arabic.

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SECTION 4: PRE-APPRENTICE SCHOOL IN SHEET METAL WORK.

This is a workshop of the Society for the Development of Apprenticeship, for work in tin, sheet metal, etc. The section of our Commission which visited this school had an interesting conversation with Charles Kula, originator and director, who acted as guide.

This school does not aim to turn out specialists, but rather to make good artisans in all lines, and to give boys workshop discipline. They must be on hand punctually, must attend regularly, work diligently, and keep themselves clean both in body and mind. Every Saturday they must take a shower bath, and every day, summer and winter, a warm douche. There is proper provision for cleanliness in all parts of the shop. If they do not follow the regulations strictly they are expelled.

About 70 boys aged 12 or 13 are fitted to become workmen of any kind. They prepare work from drawings; everything must first be drawn. They work in tin because the material is cheap and can be thrown away if the work is not good. "There is an enormous waste; the question of apprentices is a question of waste."

Mr. Kula claims that after two years they are in a position to go to any workshop, even to that of a watchmaker. Some have gone to watchmakers and started with 30 cents a day, and some of the young men not 16 years of age can earn \$1.20 to \$1.40 a day. Everything is made by hand, no machinery, except ordinary tools, being used. This is to exercise their hands and train the pupils for manual work. They also work in wood, in iron and other metals.

MR. KULA DEPLORES STREET INFLUENCES.

The younger they come to the school the better for them, because they are taken from the Primary School. If allowed to run the streets after leaving the Primary School they are spoiled for all time to come, because after the Primary School they are not fitted for anything, being too small and too young to go to a regular workshop, for the shops do not want them at that age.

At the Primary School the boys have been sitting at a desk; here they are made to work in a standing position, because it enables them to breathe freely and prevents consumption. They sit only at work which can be done as well in that position as standing.

In winter they work 8 hours a day, in summer 9 hours. They are thus kept off the streets. There are no holidays whatever; but if they want to go to the country they may ask permission, and are then allowed to go for three or four weeks. They must go to the country, and must not hang around the streets, where they would lose the benefits gained at the shop. The boys all belong to workmen's families only—poorly paid persons like porters, door-keepers, and servants.

WORK IN TIN AS BASIS.

Every morning the pupils have $1\frac{1}{2}$ hours of drawing, the rest of the day being devoted to manual labor. The pupils make drawings of natural size, designs of grates and brass finishings. Pupils enter whenever they wish, and generally take a two years' course.

The tinsmith trade is the most typical trade, in Mr. Kula's opinion, and he calls it the standard trade. It is a type; that is, it is the basis of everything. In the tinsmith's course the boys make coffee filters, watering-cans, etc.

Dishes were shown with bottoms hammered, rounded, etc. Mr. Kula holds that if a tinsmith can make a bevel of his tin he is on the way to become a good tracer; he can then trace in gold, copper, silver, etc., as it is done on exactly the same principle. When a young boy has learned this work and is able to do it in tin he can do it in any kind of metal, and metal working is the foundation of many trades.

RELATION TO APPRENTICESHIP.

Apprenticeship consists of learning a special trade, but here there is no special trade. The preparation of apprentices corresponds to about four-fifths of the apprenticeship itself, because what the pupils learn here is the most difficult part of apprenticeship.

Every boy makes his own tools, and learns to forge and temper all tools as well. All machines are worked by hand; Mr. Kula believes that all machines moved by electricity or steam are against apprentices. In the meantime, they get physical exercise by blowing the bellows. They work in wood merely to show the adjustment to work benches, but the sheet metal is the important part. They are taught to solder. The workshop must be kept clean. There are individual lockers and a washroom with brass finishing, highly polished.

The term of apprenticeship is not officially fixed at 2, 3, 4 or 5 years; it all depends on the masters who are training the boys. The school cannot take more than about 70 pupils in all; it is a question of money. One foreman cannot look after the work of more than 35 boys.

SPECIMENS FROM ALL-ROUND WORKMEN.

In the large hall there were specimens of work in tin, iron, brass and wood; pipes beaten out, showing how a boy could become a boilermaker; brass beaten out, preparing a boy for plumbing; wooden frames assembled and adjusted, showing that a boy has practically all there is in carpentry. Pupils made the woodwork separating the drafting-room from the workshop. Boys can go from one workshop to another, and from one branch to another. When a boy has been through this school for two years he is a little workman. He knows how to use his hands. In the provinces they have to make their own tools, and he will be in a position to make them. They earn more in employment, because the masters appreciate them. Moreover, they cannot be imposed upon by being sent on messages and becoming personal servants of masters, because they can be used for something else.

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WIDER USE OF THE SCHOOL PLANT.

Ex-pupils may come to the school and work for themselves, for their own purposes. They have the use of the shops on Sundays. Specimens of work were shown, such as coffee-pots and filters, which the boys are allowed to take home. One boy was seen adjusting the joints of a coffee-pot, putting the wire in the top edge, which requires skill only to be acquired by training in this way. Another boy was seen inserting a piece of wire into a zinc edge, which is more expensive material, and which more advanced boys are allowed to use, though tin is the metal generally used. This work gives strength and dexterity to the hand, and when the boy goes into the workshop he knows how to handle things. These little pieces of work are very interesting to the boys, hence they never lose their hour in the workshop.

Various objects are made by hand in metal that costs very little; but it would not be any more difficult to make the articles of material that costs a great deal.

BOY'S MENTALITY TRANSFORMED.

Mr. Kula claims that here the mentality of the boy is transformed, and he is made into a little workman. Moreover, the mentality of the parents is transformed. They begin to reason thus:—"I am decidedly not more stupid than my boy, yet my boy earns a good living, whereas I can hardly earn mine. That is certainly because he has been trained." The boys can come at any time. They work up. It is possible for a boy, at the end of 15 to 18 months, to be in a position to go into a workshop and earn a good living. A two or three years period is the maximum.

They have had young boys here 14½ years of age, one of whom wanted to be a tinsmith, and a master in clockwork took him and gave him immediately \$3 a week to work in his trade.

The following samples of work were shown; a lantern of iron and glass; brass lantern; tin cash drawer; coal scuttle of sheet iron, with ribs beaten out and wire inserted in the top; a large zinc iron-handled pail with a top, coffee-pots with strainers inside, the tops of the pots having been curved with hammer. These articles are given to the pupils' parents. The rule is, "Never use your scissors except after making a very good tracing, or else you will spoil your goods."

SECTION 5: SUPPLEMENTARY COURSES IN PARIS.

In Paris two-year courses of technical instruction (manual work) for adults are held in 13 boys' schools. These courses are free and are intended for young persons, who having completed their primary studies desire to finish their education by acquiring the scientific knowledge necessary for workmen. They comprise geometry applicable to work in shops and to tracing out material

for work; graphic executions and sketches on panels; elementary lessons in technology or industrial electricity; work in wood or iron in the shop to apply the elements of geometry learned, and to execute pieces of work from their own drawings. The courses are held daily from 8.30 to 10 p.m., except on Saturdays, and work in the shops on Sundays from 8 to 11 a.m.

Pupils must establish their French nationality and be fully 12 years old, possessing the certificate of primary studies; otherwise they must be fully 13.

Whatever knowledge a person may have acquired already in any branch whatever, he can find a course to develop or perfect it. The graded courses are held once a week each from November to Easter.

There are several large popular educational societies in Paris. The Society of Elementary Education organized courses for women and girls (admission by card) and their educational activity is still exercised in other forms. Courses for both sexes, entirely free, are given by the French Young People's Union, the Society of Modern Education, the Polytechnic, Philotechnic, the Philomathic and Polymathic Associations. The only restriction is an age limit of 14 or 15 years; nevertheless there are exceptions, especially in the musical courses.

SECTION 6: VOCATIONAL COURSES OF THE SYNDICATES.

Some 60 courses have been organized in Paris by Syndicates of employers such as Jewelers and Goldsmiths, Bleaching Houses and Laundries, Bakers, the Company of Bronze Manufactures, Association of Herbalists, Grocers' Syndicate, etc.; also 70 courses have been established by Syndicates of employees such as the Syndicates of Journeymen Bakers, of Female Cashiers, of Journeymen Carpenters, and various labour exchanges in connection with the workmens' Syndicates. In addition to these, mixed Syndicates of employers and workmen, such as the Union of Female Professors and Composers of Music, Professional Hairdressing Association, Professional Association of Horticulturists, Gardeners and Agriculturists, etc., have also organized various vocational courses.

COURSES FOR APPRENTICES AND WORKMEN.

Jewelry: The Vocational School of Drawing and Modelling was established by the Syndicate of Jewelers and Goldsmiths, at the rue de la Jussienne. The evening courses take four years: 1st year, elements of geometrical and ornamental drawing, linear drawing; 2nd year, elements of geometrical and ornamental drawing, elements of architecture; 3rd year, ornamental drawing, figures, modelling ornaments and figures; 4th year, ornamental drawing, figures, study of styles, elements of modern composition, modelling and composition.

Schools of modelling, drawing and engraving of fancy articles of all kinds, are carried on at 22 rue Chapon.

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Bronze: Schools of drawing, modelling and chasing of the Corporation of Manufacturers of Bronzes and of the cast iron, zinc, silver and plastic art trades at 8 rue St. Claude.

Coach-building: Vocational and artistic courses in coach building, established under the patronage of the Syndicate of Coach builders (employers) at 24 rue Laugier.

Stoker-machinists: The general trade federation of Electrical Stoker-Machinists of railways and manufactories has established courses, for stoker-machinists and electricians, treating of steam boilers; steam engines; gas, petroleum, alcohol, and compressed air motors; legislation on steam apparatus, industrial electricity, and industrial drawing. The courses are held in 21 sections.

The Syndicate has also organised vocational courses at Nantes, Chantenay, Le Faouet (Morbihan), St. Nazaire, Saintes, Epinal, Sens, Héricourt, Luxeuil, Le Havre, Evreux.

Pupils are enrolled in each of the above courses.

Stokers, conductors, machinists and automobilists.—The Central Federation of stoker-conductor-machinists of all trades has organised courses to develop knowledge necessary for running steam apparatus, dynamos, automobiles, etc. These courses are held at four divisions in Paris, and also at five places in the suburbs.

There are vocational courses at the Central Union of the stoker-conductor-machinists of manufactures and navigation of the Department of the Seine (Labor Exchange).

Roofing and plumbing.—Theoretical and practical courses of the Syndicate of roofing, plumbing, sanitary, and hygienic contractors of the city of Paris and of the Department of the Seine, 8 rue des Poitevins.

Cabinet-work.—School of professional drawing, 10 rue St. Nicholas. Founded by the industrial patronage of the Children of Cabinet-work. Professional courses of the Syndicate of cabinetmakers of the Department of the Seine (Labor Exchange).

Flowers and feathers.—The Society for paternal aid to children employed in the flower and feather industries has organised courses which are held every Sunday morning at 10 rue de Lancry. All workwomen and apprentices in the artificial flower making and feather dressing trades are admitted by request. The elementary course is given from 9 to 10.30 a.m., and the course in drawing from 10.30 a.m. to noon.

The Society has established family or boarding groups, intended to facilitate apprenticeship.

Joinery and wood flooring.—Schools of drawing and modeling were established at the end of the year 1891 by the Syndicate of contractors of joinery and wood flooring. The courses are held from 8 to 10 p.m. at 3 rue de Lutece, 20 rue Falguière, 236 Faubourg St. Martin, and 105 rue Lemercier. They comprise 4 years of study; 1st year, plane geometry, linear drawing, ordinary joinery sketching, assembling, sale of woods, elements of diseases of trees, defects of woods, etc.; 2nd year, geometry in space, placing of joinery and wooden floors,

measuring, ornamental drawing, and history of joinery; 3rd year, descriptive geometry; 4th year, applied descriptive geometry. Modelling workshops will be opened soon near the schools.

Paper-makers and pasteboard-makers.—A professional school established by the Syndicate of paper and paper-transforming industries, for apprentices and young employees of both sexes in the industries which form the various committees of the syndical paper group, 10 rue de Lancry; separate courses for paper-making apprentices and pasteboard-making apprentices; competitions and prizes.

Upholsterers.—Courses organised by the Syndicate of decorative upholsterers, 3 rue de Lutece. Theoretical and applied courses in geometry, drawing, and cutting of materials.

Carriages.—Technical courses of the Syndicate of carriage makers, 11 avenue des Ternes. Two courses in drawing, viz., drawing of the carriage body and drawing of the mounting.

SECTION 7: VOCATIONAL AND DOMESTIC SCHOOLS FOR GIRLS.

These schools were established with a view to enabling girls to serve both theoretical and practical apprenticeship to a trade whilst completing their primary education. They replace outside apprenticeship, which is always insufficient and often disastrous. The nature and number of the trades taught depends on the district where the schools are situated.

Pupils competing must be at least 13 and not over 15 years of age, but all who hold the certificate of primary studies are permitted to compete from 12 years of age. Girls who have attended for a year the Supplementary Courses of the Primary Schools may be excused from the age limit.

The competitive examinations vary slightly at the various schools. They generally consist of dictation, two problems in arithmetic, a composition of simple kind, an ornamental drawing, and an exercise in ordinary sewing.

The apprenticeship lasts three years, except for those who are learning painting or industrial drawing, which studies require 4 years.

During the entire apprenticeship the pupils are practised in turn on ordinary sewing, and kitchen and household work. They are thus prepared to fulfil the home duties which await them later on.

In all the schools the pupils arrive at 8.30 a.m. and leave at 5.30 p.m. The morning is devoted to general instruction, and the afternoon to vocational instruction.

Besides maintenance scholarships, these are sometimes granted for breakfast and clothing.

JACQUARD SCHOOL.

This School, at 2 rue Bouret, is for girls aged 13 to 15 years on admission. Course three years.

General Courses.—Primary instruction, elements of accounting, drawing, domestic economy, cutting and assembling, cooking and household work, and mending clothes.

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Vocational Courses.—Sewing dresses and dressmaking, corsets, underwear, millinery and dress, vests and children's costumes, ladies' jackets, embroidery for furniture and costumes, fancy flowers and feathers, and straw hats.

Breakfast scholarships are granted to a considerable number of pupils.

Our Commission secured some excellent drawings by girls of this School—one of them a portrait in colors, taken from life, exhibiting a recent creation in Parisian gown and hat.

GIRLS' SCHOOL AT 7 RUE DE POITOU.

General Courses.—ethics and civic instruction, French language, arithmetic, elementary principles of the sciences, history and geography, linear and ornamental drawing, ordinary sewing, cutting and assembling, accounting and domestic economy.

Vocational Courses.—commercial studies: writing, accounting, elements of commercial law, English language, stenography, and typewriting; dress and furniture embroidery; embroidery on cloth, cashmere, velvet, satin, etc.; also fancy embroidery; millinery; dressmaking; cutting and making up robes and mantles; industrial drawing; drawing from the cast and from common objects; drawing from nature, flowers, and plants; geometrical drawing (projections, shading, perspective); decorative composition, water color and fans; also painting on earthenware, porcelain, and enamel.

CHAPTER XXXV: SECONDARY TECHNICAL INSTRUCTION.

Before the present Republic was created, technical institutions of the highest order had been established in France, and numerous specialist trade schools were in vigorous operation. These had been created by private enterprise. The following dates may be of interest:—Foundation of Museum of National History, 1793; National Conservatory and Polytechnic, 1794; School of Commerce and Industry, Paris, founded by two merchants in 1820; Central School of Arts and Manufactures, 1829; Philotechnic Association for social improvement as well as industrial training, 1848. Branches of the two latter institutions had been formed in all the chief cities of France, later on being recognized by public decrees.

Trades Unions or Syndicates of workmen increased rapidly after 1830, and worked to raise the standard of arts and crafts which they represented.

The commercial importance of all this activity and improvement of the working classes was shown at the International Exhibition in London in 1851, which drew the attention of the world to the superiority of French manufactures. Progress during the period of the Republic has been marked by the controlling influence of municipalities and the National Government, it being recognized that only these authorities could adequately provide for industrial training of the masses.

SECTION 1: NATIONAL SCHOOLS OF ARTS AND TRADES.

The great body of Arts and Trades Schools belonging to the secondary class were established by corporate bodies—Chambers of Commerce, Trade Syndicates, associations such as the Philotechnic, or private individuals. They are distinguished from the schools of the primary class by many features, of which the most important are:—(1) their narrow specialization; (2) the maturer age of their pupils, who as a rule are persons already working at their trades; (3) the general absence of entrance requirements; (4) their origin and sources of support.

The names of the individual trade schools are a sufficient index of their character, e. g., the technical schools for masons, established by Paris societies of masons and stone cutters; courses for tailors, maintained by the incorporated body of tailors; schools for jewelry manufacture maintained by the jewelry Syndicate. The purpose of all such schools and courses is to perfect workmen in their craft. The instruction is almost always free; indeed, liberality is the impressive feature of this enormous effort on the part of manufacturers, employers of labor, chambers of commerce, and trades unions to maintain the standard of French industrial art and its commercial prestige.

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HIGHLY SPECIALIZED TECHNICAL SCHOOLS.

The National Schools of Arts and Trades are highly specialized technical schools with elaborate equipment for workshop practice. Situated respectively at Aix, Angers, Chalons-sur-Marne, Lille and Cluny, each one is easy of access to all the Departments of a large geographical section. A law of 1906 authorized the establishment of a sixth school of this class at Paris, which was opened in 1910. The Government appropriation for the current expenses of these schools amounted in 1910 to \$374,696, or 23% of the total appropriation for technical and commercial education.

The schools themselves are under the jurisdiction of the Minister of Commerce and Industry, and under the immediate supervision of the Prefect of the Department in which they are situated.

For some 300 places offered for competition each year, there are no fewer than 1,200 or 1,300 candidates. These schools have all the prestige of government institutions, by which the French parent sets such store. An even more potent source of attraction is the prospect they hold out to all fairly industrious and well-educated students of escaping two years of military service, such dispensation being granted by law to four-fifths of the number of students who at the leaving examination obtain 65% of the total possible marks.

TERMS OF ADMISSION.

Admission to these schools requires French citizenship, and candidates must be above 15 and below 17 at the time of the competitive examination (1st October of each year). Two examinations are required; one before a jury sitting in the principal town of the Department, the other before a Government Commission appointed by the Minister of Commerce. Admission requirements comprise written composition and oral examinations in orthography, arithmetic, elements of geometry, linear and ornamental drawing, and the four elementary operations of algebra.

Since 1903 it has been obligatory for candidates to possess one of the following: (a) certificate of practical industrial studies; (b) certificate of higher primary studies; (c) 1st class diploma of the Civil Engineering section of La Martiniere School; (d) certificate of secondary studies, bestowed at the end of the first period; (e) diploma granted to third year pupils in the Industrial section of the Eastern Professional School of Nancy.

The candidates must undergo a manual test before the Commission, working, at their option, a piece of iron or wood to conform to a given drawing which is handed to them. The iron test consists, at the choice of the candidate, in adjusting or forging work. A candidate may request to have a test in founding substituted for this work; he must mould his piece in green sand and put it into lead.

In order to be definitely declared admitted, that is to say, fit to follow the theoretical and practical courses of these schools, it is necessary (1) to have received no lower mark than 6 at oral tests; (2) to have obtained for the total

written tests, manual and oral, at least 348 points (three-fifths of maximum). But as each school has only 100 places at its disposal annually, only the first 100 successful candidates can be admitted. These are sent to the school of their Department, but exceptions may be authorized.

Most of the pupils are from the public schools, and belong to the working classes or are the sons of small shopkeepers or Government officials. They are all boarders. The pupil pays \$120 annually for full education, board and lodging. For the three years' course \$60 more are required for the outfit. In general, however, at least three-fourths of the pupils are in receipt of Government Scholarships, which cover the cost of tuition and living, hence the schools are practically free.

All Manual Preparatory Industrial Schools of Apprenticeship and all other Vocational Higher Primary Schools prepare for these Schools of Arts and Trades, either in a regular way or when the candidates present themselves.

PLAN OF THE COURSES.

The school day comprises 3 hours class, 3 hours study, 3 hours in workshop.

1st year: French reading with explanations and French composition; mathematics; advanced algebra; advanced geometry; surveying and levelling; trigonometry, differential calculus; descriptive geometry; physics; chemistry; metalloids; moral and civic education.

2nd year: Geography; French and exercises in composition; elements of industrial accounting; elements of industrial legislation; mathematics; elements of analytic geometry; elements of integral calculus; descriptive geometry and theoretical and applied cinematics; chemistry; metals; metallurgy and elements of organic chemistry.

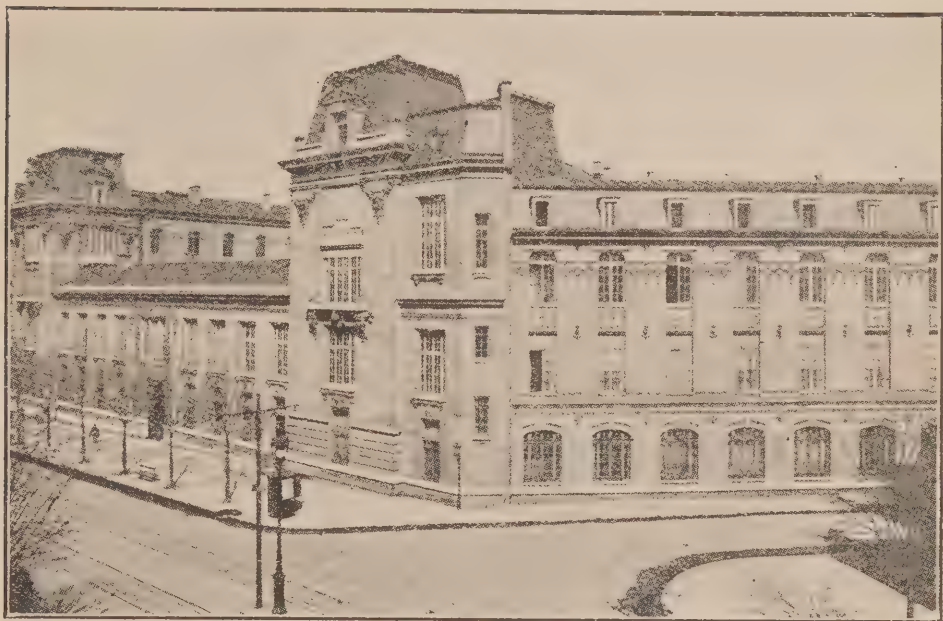
3rd year: History; French; exercises in composition; general mechanics; applied mechanics; machines and motors; industrial physics; electricity; heating and ventilation; lectures on hygiene.

Pupils when leaving may obtain the title of "Engineer of the National Schools of Arts and Trades," established by decree of October 22, 1907, or the diploma of ex-pupil.

Although these schools have been specially designed to train manufacturers, a large number of other careers are open to ex-pupils, among others railroading, bridge and road building, military engineering and mechanical employment for the Navy, etc. Those who are very good general draftsmen have opportunities of entering the service of large industrial corporations as draftsmen.

SECTION 2: HIGHER PRACTICAL SCHOOL OF COMMERCE AND INDUSTRY.

This School, at 79 Avenue de la République, Paris, is the oldest commercial school in France, founded 1820. It is maintained by the Paris Board of Trade (600,000 francs), the city of Paris (50,000 francs) and students' fees; 170 live



HIGHER PRACTICAL SCHOOL OF COMMERCE AND INDUSTRY, RUE DE LA REPUBLIQUE, PARIS.



LABORATORY.

at the school and pay from 1,200 to 1,400 francs a year; there are also half-boarders who pay 700 francs; others pay 300 francs. Half-boarders arrive at 8 a.m. and leave at 5 p.m. They get breakfast. Any deficit is made up by the Board of Trade. The Directorate is made up of 40 prominent business men and industrial leaders who have been or still are in business. Those in business must belong to the Board of Trade, which has an income of 700,000 francs derived from the various business men who are members, and who are entitled to elect the 40 Directors.

The building cost the Board of Trade 3,000,000 francs, and is now too small.

THE SCHOOL OF COMMERCE.

Boys are admitted from the age of 12. The first stage (3 years) is for boys between 12 and 16, and those who wish to go then into business receive certificates. The second stage (2 years) is for boys of 16 or 17 who wish to get higher commercial training. At the end of the two years they compete for a higher diploma awarded by the Minister of Commerce in person. They may be a little over 18, and are generally 19. Some exceptionally clever boys receive the diploma at 14, but this practice is not encouraged, as it is not considered that their minds have sufficiently matured at that age.

There are 530 pupils, 300 in the first section, 230 in the other. About half of the boys who start at 12 years continue till 16, and the others till 18. The majority of them are certificated Primary School pupils. There is, of course, a special examination in the school.

Second grade pupils generally come from the State Lyceums, where they follow a classical course, but not wishing to complete their studies at the university they come to this commercial school.

THE MARITIME SCHOOL.

This school also includes a special superior State School of Maritime Shipping, established six years ago under the auspices of the Minister of Commerce. 20 pupils are admitted annually by special examination, being selected out of 60 or 80 candidates. The school prepares future lieutenants and captains of the commercial marine for deep sea sailing.

The Board of Trade has a sort of proprietary port at D'Ivry on the Seine and derives a revenue from the shipping, like harbour commissioners. They have machinery for loading, unloading and handling goods, also freight shed, etc.

They have also laboratories for testing silk, wine and similar goods, for which a fee is charged. It is a kind of official service, but the duty is assumed by the Board of Trade, whose budget must be laid before the Government, which has authorized the transaction but does not control it.

THE SCHOOL OF NAVIGATION.

As the only one of this standing in France, the school has a special grant from the State, which pays the special staff of professors, composed of ex-sea-

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captains, engineers, etc. The class-rooms are at their disposal. Young men who attend this school are generally State scholarship holders. Out of 20 pupils, 5 or 6 pay fees. The National State Departments of Commerce and Industry and of Posts and Telegraphs regulate this.

On graduation, pupils are required to spend 5 years in navigation, and then pass another examination before they can command a boat and assume duties as navigators. Their certificate must state that they have been to the school and also served 5 years, and this must be obtained before they are 25 years of age.

The School of Hydrography trains seamen for short fishing voyages to Ireland, Newfoundland, etc.

The Maritime School professors are appointed by the State, and those in the Commercial School are nominated by the Board of Trade on the proposal of the director approved by the Minister.

EVENING CLASSES.

There is a fourth department, consisting of evening classes, founded and maintained by the Board of Trade, for young clerks who desire to improve their knowledge of their own special branch. Students must be at least 15, but the age runs up to 40. These classes are attended by 450 young men and 220 girls.

After one or two years, a special prize is awarded, in the form of a travelling scholarship, entitling the holder to go to England, Germany or Russia. The only condition is that students must go into a distinct line of business of their own speciality; and then when they return they must make a report of what they have seen. For instance, one student in the fur business in Paris went to Russia and studied conditions in a fur house there, and returned with a full report.

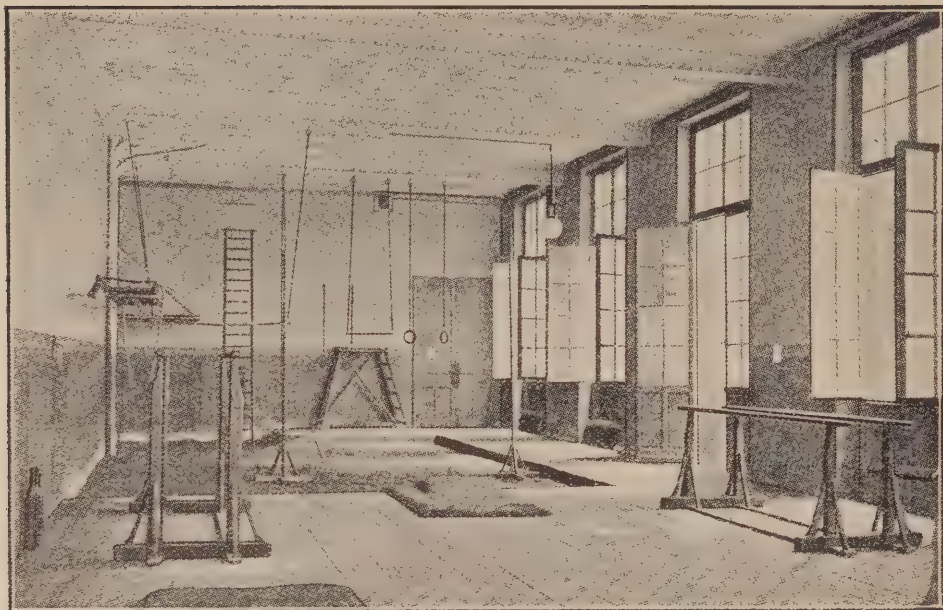
The same system is offered to the second-stage pupils in the commercial school from 16 up. The scholarship comes from different sources; it may come from the State, or from the Council Chamber of the Seine, or from different corporations. Many kinds of scholarships are given to the school in the same way as in the evening classes.

Instruction in the evening is about the same as in the daytime; French, English, German, Spanish, typewriting, stenography, bookkeeping. No comparison can be made between evening students and day students, as the former attend only three times a week.

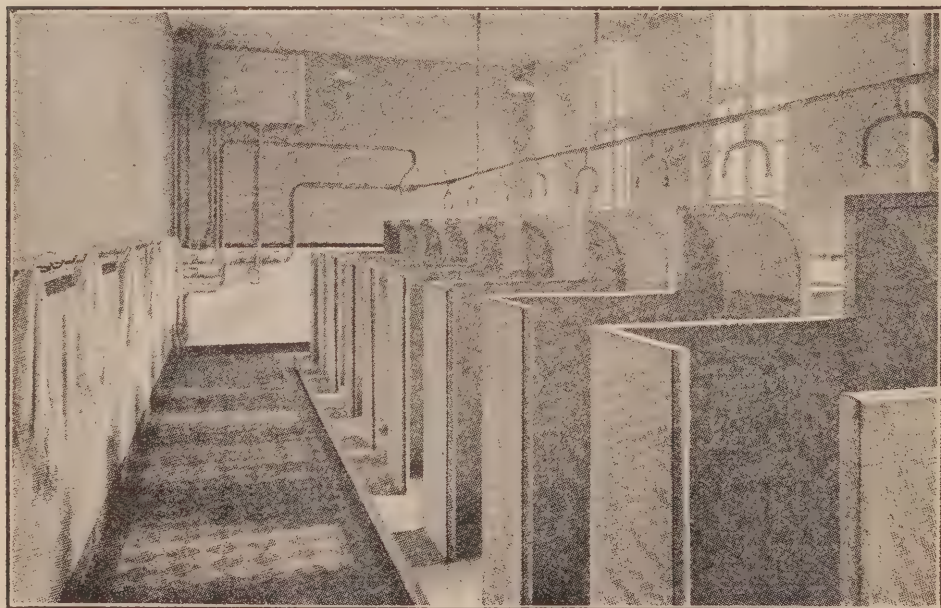
Day pupils are practically boarders in this school. A talented boy attending an evening class for a certain time could acquire about the same amount of instruction as a young man of 16. Of course they have an advantage over day students in that they have practical experience.

EXPERTS AS TEACHERS.

There are two classes of professors:—(1) those who teach geography, etc.; (2) business men who teach their specialty for an hour or two; also expert accountants, railway men, etc., and the government textile inspector, etc. Transporta-



GYMNASIUM.



SHOWER BATHS.

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tion problems, for instance, are dealt with by an engineer of a leading railway who lectures for 3 or 4 hours a week. In this way the students are kept in touch with industry.

There are complete physical and chemical laboratories.

The drafting room is well finished, with plaster casts arranged around the walls, and well lighted from sides and above.

The dormitories are furnished very plainly, and there is running water in all the rooms, which are divided by partitions extending part of the way up.

Dinner is at noon. 350 eat at each table, these being of marble with plain benches at either side. Billiards, checkers, chess and dominoes are played in the small adjoining room.

There is a preparatory chemical laboratory; gymnasium, etc.

In Paris there are 3 commercial schools like this one, and 15 more are distributed over France. Pupils in all are entitled to pass an examination for bursary, and are selected in competition from all those schools in France; two or three may be chosen in this school and one or two in another place. These scholarships vary from 1,000 francs to 3,000 francs, and run from one to two years.

VISITS TO FOREIGN COUNTRIES.

During Whitsuntide foreign vacation trips are taken annually by the best students on the list as a reward for special merit. The Director accompanies them and they stay eight days. Last Whitsuntide 18 students went to Belgium and studied business customs.

Students visit different establishments in Paris and make reports.

These visits are made by all the students.

The school has a bureau and permanent secretary for permanently placing students, the expenses being borne by an association of ex-pupils, founded for mutual help. As a general rule all the good pupils are placed in that way.

CHAPTER XXXVI: HIGHEST TECHNICAL INSTRUCTION.

The highest grade of scientific and technical instruction in France is given in special schools, such as the National Conservatory of Arts and Trades, the Polytechnic School, etc. These schools are intended to prepare men for the technical service of the State, or to become directors of enterprises which require both scientific and technical knowledge.

The Higher Technical Schools are under different ministries, viz., the Ministry of Commerce, of Agriculture, of War, etc., according to their courses.

The principal schools of this high order under the Ministry of Commerce and Industry are the following, all situated in Paris:—Central School of Arts and Manufactures, 700 students; National Conservatory of Arts and Trades, 100 pupils; Superior School of Navigation (number of pupils not stated).

Other technical schools, such as the Polytechnic, the Agronomic Institute, etc., are under the Ministries who have charge of their special courses.

A significant fact in the recent history of higher education in France is the multiplication of chairs for scientific branches in the University faculties, and the equipment of laboratories and institutes for the promotion of scientific research and experimentation. As a result of this activity, provision for the highest order of technical training, formerly confined to the special schools located at Paris, is now made, to some extent at least, in all the University centres of the country. For example, at the University of Marseilles there is a Chair of Industrial Physics and another of Industrial Chemistry, and similar Chairs at both the University of Bordeaux and of Nancy. At the University of Lille there is a Chair of Applied Chemistry, and at Lyons, Chairs in Chemistry applied to Industry and to Agriculture. Through this extension of University activities, extreme specialization in the province of Higher Technical Education in France is giving place to the principle of co-ordination and philosophic unity.

SECTION 1: CENTRAL SCHOOL OF ARTS AND MANUFACTURES.

This School, at 1 rue Montgolfier, Paris, is especially intended to train engineers for all branches of industry and for those public works and services whose management does not necessarily come under the charge of the State engineers. It gives a very general course of education, comprising all branches of science connected with the art of engineering, but only as much time is devoted to theory as is necessary for its practical application.

Admission is by examination (fee 20 francs) held annually at Paris in June; candidates must be 17 years of age on the 1st January of the year of competition.

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There is no upper age-limit. Foreigners are admitted on the same footing as Frenchmen. No diploma is required. The examination is both written and oral, and comprises the following subjects, the values of which are stated:

<i>Written Compositions.</i>		<i>Oral Examinations.</i>	
Trigonometry and Logarithmic Calculus....	3	Analytic and Mechanical Geometry.....	5
Mathematics.....	5	Arithmetic, Algebra and Trigonometry..	5
Physics.....	2		
Chemistry.....	2	Elementary and Descriptive Geometry..	5
Draft.....	3	Physics.....	5
Architectural Drawing.....	4	Chemistry.....	5
Machine Drawing.....	2		
Machine Sketching.....	2		

Candidates who produce bachelors' diplomas or certificates relating to the first part of the baccalaureate examinations, or diplomas of the National Schools of Arts and Trades, receive a bonus of 15 marks.

Intending students must be well used to machine and architectural drawing and aquatint, and in studying drawing must apply themselves equally to the attainment of rapidity of execution, exactitude of form and purity of touch. They are advised to practise reproduction of drawings given at previous entrance examinations of this school, and machine drawings given at the School of Arts and Trades, as many candidates fail at shadow tracing. When presenting himself for examination, each candidate must hand in collections of drafts, machine and architectural drawings, and freehand sketches.

The number of pupils admitted annually averages from 230 to 250.

DISCIPLINE, FEES, ETC.

This school accepts day scholars only, and does not exercise any supervision over them outside of school hours; but this does not militate against their satisfactory progress, the importance and frequency of examinations and competitions being sufficient to insure discipline and prevent pupils from neglecting their lessons. The course runs for three years, during which time those not profiting by instruction are expelled.

The tuition fee, including cost of experiments, is 900 francs for first year, 1,000 for each following year. The entire cost of supplies and drawing material must be defrayed by pupils. Tuition and maintenance expenses are estimated at 3,000 francs a year, and parents are advised to allow their sons more. French pupils who cannot meet these expenses, and who are among the first 120 on the list, may obtain subsidies from State funds; these are originally granted for one year, and may be renewed and combined with those allowed by Departments and Communes, which are often given. Notably the City of Paris assists a large number of pupils. The Department of the Seine has voted a subsidy of 3,000 francs, available only to pupils domiciled in the Department and outside of Paris.

The State subsidies distributed among the pupils in 1908 were 50,000 francs; these usually equal half the tuition fee; the allowance may be a little

larger in the second and third years if the pupil has gained a place. In 1908-9 9 scholarships were given at 200 francs, 24 at 300, 20 at 400, 30 at 500, 12 at 600, 12 at 700, and 3 at 800.

The State also grants for graduates of the National Schools of Arts and Trades a subsidy of 30,000 francs, divided equally between preparation of pupils for the Central School and the maintenance of those admitted.

COURSE.

The course of instruction is as follows:

1st year.—Analysis (differential calculus and integral calculus), general mechanics, thermo-dynamics, descriptive geometry and its applications (shadows, stonecutting and timber-work), general physics and chemistry, mineralogy and geology, elementary and civil construction, and hygiene and applied natural sciences.

2nd year.—Theoretical and applied resistance of materials, construction and erection of machines, metallic constructions, industrial physics, applications of electricity and light, steam engines, analytic chemistry, chemical technology, architectural and civil constructions, and industrial legislation and economy.

3rd year.—Applied mechanics (hydraulics), construction and erection of machines, industrial chemistry, general metallurgy and metallurgy of iron, mining, public works, and railways.

These varied studies are completed by exercises and manipulations carried on at the school, by operations on the ground, and by visits to the factories and workshops. The pupils must make numerous plans, with documentary memoranda, of the following objects: metal bridges, steam engines, civil constructions, machine-tools, etc. (2d year). Manufactories of chemical products, machine construction workshops, locomotives, blowing machines, hydraulic establishments, etc. (3d year).

At the end of the 2d year the pupils specialise in one of the 4 following branches: machinists, constructors, metallurgical miners, and chemists. The courses are open to all the pupils, only the work and practical exercises and the plans to be made differing according to the specialties; but since 1900 the diploma no longer bears the mark of a specialty.

BUILDING AND EQUIPMENT.

The building has been admirably laid out to answer all the requirements of such a varied curriculum. It comprises 60 study halls, 3 amphitheatres, laboratories, galleries of collections (drawings, models and apparatus), and an extensive library. It distributes among the pupils of each division the school Portfolio, an album lithographed every year containing the most notable drawings brought in by the pupils from their vacation trips. This vacation work is obligatory, and note is taken of it in the graduation classification.

A system of weekly examinations serves to keep pupils always on the alert, and makes it possible to ascertain their progress at any time. The marks obtained

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at these examinations, as well as those for plans, vacation work, general examinations and the final competition, serve to make up the graduation classification. The final competition consists in the execution of a general plan and the composition of a memorandum in support of it. The pupil has 30 days in which to compose this plan, and is obliged to present it and discuss his work personally before the examining jury.

The diploma of Engineer of Arts and Manufactures is granted to those pupils who obtain a total average of 14.

To obtain the diploma pupils must pay 100 francs, 50 of which are refunded in case of failure. Those who so fail, but prove that they are adequately instructed (the average required being 13) receive a "certificate of capacity," and they may compete a second time for the diploma within 5 years. In 1908 graduating pupils received 224 diplomas and 14 certificates; ex-pupils re-admitted to the examination, 6 diplomas.

The careers open to graduates are as numerous as their acquirements are varied. Besides the openings which they find in business, as engineers, superintendents of mills, heads of works and factories, constructors, etc., they may become professors of applied science, etc. Pupils who pass out high are in demand in business, and many have positions guaranteed to them in advance by relatives or others; those who have neither fortune nor relatives, though sometimes finding difficulty at the outset, always succeed in finding positions eventually.

A certificated pupil, unless he has exceedingly bad luck, always finds a good position. Salaries of 4000, 5000 and even 10,000 francs are quite frequently obtained by graduate engineers of a certain standing, and much more brilliant positions are by no means rare.

The State, which has so many employments at its disposal which Engineers of Arts and Manufactures would be quite well fitted to fill, does not definitely place any of them at the disposal of graduates.

SECTION 2: NATIONAL CONSERVATORY OF ARTS AND TRADES.

This is both an industrial museum and an educational institution under the Department of Commerce and Industry at 292 rue St. Martin, Paris. It is of the greatest service as a museum and high school of science applied to industry, and contributes in a great measure to the progress and popularisation of industrial questions.

The financial law of April 13, 1900, invested it with a civil character, and gave it an administrative council. The law of July 9, 1901, and various decrees reorganised and completed it by the establishment of (1) laboratory for mechanical, physical, chemical, and machinery experiments; (2) a "national office of industrial property," patents of invention and trade-marks; (3) a museum of industrial hygiene, and for the prevention of accidents among workmen.

These new institutions are productive of excellent results in the industrial world.

The administrative council and the director are assisted by an advisory council of instruction and by three technical committees for the departments named.

The Experimental Laboratory undertakes for manufacturers, merchants and private individuals, all kinds of tests and standardizing with reference to physics (except electricity and magnetism), metals, building materials, machines, and new or insufficiently known vegetable raw materials. There is a charge for these tests, the results of which are entered in reports or certificates of standardizing which are sent to the public.

The Museum contains full and valuable collections of scientific instruments, models of machines and objects of art given by inventors or manufacturers, or purchased by the institution. All arts and sciences applied to industry are liberally represented; physics and mechanics, geometry, weights and measures, geodesy, topography, clock-making and astronomy, building arts, hygiene, social economy, agriculture and country engineering, apparatus for transportation and railways, mine working, metallurgy and metal working, lighting and heating, chemical products, glassware, pottery, spinning and weaving, printing, engraving, photography, etc. The public is admitted to the exhibition galleries of the Conservatory every day except Mondays and Fridays.

The Library contains a fine collection of over 40,000 volumes and 2,000 maps relating to the sciences, the arts, agriculture and industry. It is open during the week, Mondays excepted.

INSTRUCTION.

The Conservatory gives oral as well as visual instruction. There are 22 professorships, all filled by celebrated men. In 15 of these are taught the sciences applied to the arts, and art applied to the trades; in the others, political and industrial economy, social economy, social insurance and provision, commercial law, industrial and commercial geography, industrial hygiene and the regulation of workmen's associations.

These courses are to the industrial sciences what those at the College of France are to pure science. The professors keep track of all the latest industrial changes, and explain the most recent improvements. The courses run from two to three years.

The instruction, although of a scientific and advanced character, is none the less entirely practical, and adapted to the various classes of students.

The instruction can be followed, with the same advantage although not at the same level, in a class attended principally by constructors of bridges and roadways who intend to become engineers, or at a course attended by numerous foremen or workmen sent by their employers, as well as by heads of factories in Paris and the suburbs, and also by engineers. The course in agriculture may be followed by a great number of agricultural proprietors spending the winter in Paris, whilst that in agricultural chemistry is by its nature accessible only to a very small number of those admitted.

As the instruction is intended especially for those engaged in business or industrial pursuits during the day, the lessons are given in evenings from Novem-

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ber till April. All courses are held twice a week, excepting those in commercial law, industrial and commercial geography, and social economy and hygiene, which are held only once a week. Classes are free to the public.

Certificates are given at the end of the year, the standing of candidates being ascertained by estimating the marks earned on the sheets, the drawings and designs executed, and work done in the professor's laboratory, the total marks required being 14.

Candidates for all the annual certificates, relating to the full period of at least two courses which are complementary and have the same industrial or professional aim in view, may obtain the diploma of studies of the Conservatory by passing another general examination.

In 1907-1908 the courses were attended by 1,695 persons. Of this number 224 asked permission to take the examination. Some of them already held as many as five certificates.

Public Lectures are given on Sunday afternoons during the winter by scholars or eminent men in any branch of the sciences or applied arts, whom the public are interested in hearing in order to keep themselves informed of present day matters and of questions which cannot be treated in detail in the Conservatory courses.

The National Office of Industrial Property was instituted by the law of July 9, 1901, which transferred to the Conservatory the industrial property service formerly located at the Department of Commerce. This office, established to meet the desire of the International Convention of March 20, 1883, for protection of industrial property, groups together in the central business district the offices of unexpired and lapsed patents and the central trade-mark depot. The connecting halls of French and foreign patents of invention, and also that of trade-marks, are open daily, except Sundays and holidays.

The Museum of Industrial Hygiene, and for the Prevention of Accidents among Workmen was established at the request of the Association of French Manufacturers by decree of September 24, 1904. It is destined to be of great service to the working classes by diminishing the number of accidents, and by aiding the labor inspectors in the accomplishment of their useful mission.

The museum constitutes a permanent exhibition, which is continually being renewed, and presents to the public as complete a collection as possible of protective apparatus and of the most practical and most improved devices for safety and industrial hygiene.

SECTION 3: SCHOOL OF INDUSTRIAL CHEMISTRY OF LYONS.

(Chemical Institute of the University.)

This school, founded in 1883 as an annex of the faculty of sciences, is patronized by the Board of Trade and is intended to train, for industrial arts, young men who have experience in the theory and practice of chemistry.

Pupils are admitted by competition held in November. Candidates must be of the full age of 16 years and possess the general attainments necessary to enable them to profit by serious chemical studies, but holders of bachelor's degrees are admitted without competition in proportion of one-half of the places available.

The competition consists of a French composition; written examination in elementary mathematics (arithmetic, algebra and geometry); written examination in elementary physics and chemistry; questions in mathematics, physics and chemistry. All the above subjects are obligatory. Candidates may also take sciences and modern languages as optional subjects, and thus increase the number of their marks by one-quarter of the maximum given for obligatory subjects. Those who possess qualifications or diplomas receive also an advantage in marks.

The school also admits outside pupils who take part in all the exercises and may be permitted to compete for the title of Engineering Chemist of the School.

Course of studies is 3 years, beginning annually in November and ending in July, and comprises both theoretical courses and laboratory work.

COURSES AND LABORATORY WORK.

Theoretical Courses:—

1st year: Mineral, organic and industrial chemistry, mineralogy or industrial physics, photography, German.

2nd year: Organic, industrial and electro-chemistry, industrial physics or mineralogy, German.

3rd year: Organic and industrial chemistry, chemical technology, German.

The German course is intended to train pupils to translate German scientific works.

Laboratory Work:—

1st year: Mineral chemistry.

2nd year: Organic chemistry and electro-chemistry.

3rd year: Applied chemistry, textiles, coloring materials, essences and perfumes, oleaginous bodies, chemical metallurgy, and alimentary substances.

The pupils work in the laboratory from 35 to 40 hours a week. Analyses and preparations alternate from week to week, and are held under the direction of experienced masters, who train the pupils to work with care and precision.

The pupils are students of the faculty of sciences, and as such are registered at the faculty. They must be at school from 8 to 11-30 a.m. and 1-30 to 6 p.m.

The annual fee is 800 francs. Students must also deposit 100 francs as security against loss or breakage. The Department of the Rhone, the City, and the Lyons Board of Trade grant a certain number of studentships for the benefit of poor students.

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DIPLOMAS AND PROMOTIONS.

At the end of the third year, after a final examination, students receive the diploma of Engineering Chemist or a certificate of studies. Since 1907 this diploma has only been granted to those who obtained the certificate of higher studies or the diploma of technical studies in industrial chemistry before the faculty.

Pupils who have distinguished themselves in these three years of studies may receive permission to spend two more years at the school as private tutors or pupils, and to continue their work under the direction of the head professor and his assistants, and make original investigations of problems of pure science or industrial chemistry in private laboratories.

All graduates up to the present have found positions without difficulty in various industries in France and elsewhere in connection with storage batteries, dressings, rubber, limes and cements, glue and gelatine, distilleries, cyanides, electricity, electro-chemistry, fertilizers and agricultural chemistry, purification of water, explosives, tinctorial and tanning extracts, illuminating gas, oils and soaps, printing on stuffs, coloring matters, tanneries, curriers' shops, patent leathers, metallurgy, paper, pasteboard, chemical products, photographic products, pharmaceutic products, fireproof products, sugar refineries, sugar houses, stearin factories, dyeing, oilcloths, varnish, vinegar, and the laboratories of industrial analysis, agriculture, customs, railways, State, municipal, etc.

SECTION 4: CENTRAL SCHOOL OF LYONS.

This school at 16 rue Chevreul is under the patronage of the Board of Trade, and is designed to train technicians as civil engineers and factory superintendents. The course takes three years, with an optional fourth year for those who desire to specialize either in electro-technics and applied mechanics or in civil construction and public works.

The entrance examinations are held in July and October. Candidates must be of full age of 16, and file certificates of birth and good conduct. There are three written examinations:—mathematics, physics and chemistry, drawing. The oral examinations bear on elementary arithmetic, geometry and algebra, descriptive geometry, rectilinear trigonometry, elements of physics and of chemistry. Candidates who hold a degree of Bachelor of Science are examined in drawing only, and must obtain 11 marks. Candidates may be admitted direct to the second year of studies; then they undergo an examination bearing on the subjects of the first year.

The students are half boarders, taking their midday meal at the school. The annual school fee is 700 francs, besides 10 francs for use of library, from 80 to 90 francs for school supplies, and cost of breakfast about 150 francs. Pupils from outside Lyons are placed in desirable private houses. Full or partial scholarships may be granted by the Board of Trade, the Department, and the City.

COURSES.

The education is divided as follows:—

First year: Mathematics (algebra, analytic geometry, statics, surveying, descriptive geometry), physics, mineral chemistry, mineralogy, elements of technology.

Second Year: Differential and integral calculus, rational and applied mechanics, descriptive geometry, industrial physics, electricity, organic chemistry, geology, metallurgy of iron and steel, graphic statics, technology.

Third Year: Machine construction, hydraulics, resistance of materials, steam engines, civil construction, chemical analysis, public works, railways (construction and operation), general electro-technics, electric measurements, industrial legislation, industrial hygiene.

There are special studies in drawing, comprising:—1st year, freehand sketching executed at the workshops, aquatint, projections, architectural and topographic drawing; 2d year, drawing from plans, sketches to scale, etc.; 3d year, designs of machines, of factories and of various constructions.

In the fourth year the pupils are divided into two sections and follow the courses common to both sections, together with advanced special courses.

TRAINING IN MANUAL WORK.

All pupils are trained in manual work, consisting of joinery, forging, adjusting, and machine-tools in the school workshops. They make frequent visits to factories, and thus become initiated more directly into industrial matters by studying the machines and by contact with the workshops.

A system of weekly examinations is in vogue, and the marks obtained thereat added to those obtained at the examinations at the end of the year and at the final examinations, serve for promotion to the higher division, and also for classification when graduating.

A first-class diploma is granted to pupils who obtain a total average of at least 15; second-class diploma to those who obtain 13. Such diplomas confer the title of "probationary engineers."

Former pupils who hold a diploma of the school may, after a certain time, obtain another conferring the title of "Engineer of the Central School of Lyons" by fulfilling certain conditions.

Graduates find positions without difficulty in industrial establishments, especially local ones; and this is facilitated by the good offices of ex-pupils, who have formed themselves into a friendly society.

By agreement between the school and Board of Trade, pupils who during their 4th year make a specialty of the study of civil construction and public works may at the same time attend the colonial courses founded by the Board, and upon graduation readily find situations either in the Far East or in Arabic-speaking countries.

SECTION 5: ELECTRO-TECHNICAL INSTITUTE OF GRENOBLE.

The Electro-technical Institute of the University of Grenoble was organized so as to be (1) an electro-technical school where all grades of theoretical and practical instruction in industrial electricity are given; (2) a testing bureau for verification and control of all ordinary electrical apparatus; and (3) an investigating laboratory, fitted for the advancement of electric science.

By its advantageous situation in the "white coal country", close to the most numerous and important French electric installations, this Institute offers students the advantage of being a centre of information and practical studies of the highest order, especially in what concerns hydro-electrical stations with high and low falls, the electric conveyance of energy from very high tensions, and electro-chemistry.

COURSES.

The instruction given comprises: (1) courses and lectures on all subjects relating to the industrial production and utilization of electric energy, chemistry, electro-chemistry, electro-metallurgy, and industrial mechanics and physics; (2) practical workshop and laboratory work with reference to ordinary electric measurements, comprising the handling and placing of all ordinary electric apparatus; (3) exercises in making out plans and specifications of electric installations of all kinds; (4) visits to electric works and installations at Grenoble and vicinity; (5) exercises in running machines and serving part-time in the electric stations.

Admission to the lectures and practical work is reserved for students of industrial electricity proper, who must pass an examination of fitness consisting of:—(1) questions in arithmetic, algebra, geometry, trigonometry, ordinary mechanics, general physics, electricity and magnetism, chemistry, according to the educational programme given in the classes of higher mathematics in the lyceums to prepare for the Central School; (2) a test in industrial drawing and in a numerical calculation. The student must also be entered in the registers of the faculty of sciences and pay the fees for practical work.

ANNUAL EXPENSE TO STUDENTS.

The estimated annual expenses of students of industrial electricity are:—University fees: enrolment 30 francs, practical work 300 francs, examination 30 francs; school material and cost of electro-technic excursions 130 francs; cost of stay at Grenoble (9 months at 90 francs) 810 francs; total 1,300 francs. The problem of living is very much simplified for the students by the good offices of the Committee of Patronage of foreign students which acts as intermediary for several hundreds of students of various nationalities every year.

The studies at the Institute last two years; one year (A) being devoted to a study of the industrial production and utilization of electric energy by

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continuous currents, hydraulic machines, and related problems; and one year (B) to a study of the production and utilization of electric energy by *alternating currents*, steam engines, and related problems. .

Each year ends with an examination which includes:—(1) a written test (duration 10 hours) comprising the composition of a draft of an electric installation, with plans and specifications; (2) a practical test (duration 10 hours) comprising the execution of laboratory work; and (3) an oral test (duration 1 hour) consisting of questions on the fundamental elements of industrial electro-technics, mechanics, chemistry, and physics.

Candidates who are put off in July may present themselves in November.

Students who have successfully passed the two final examinations at the end of (A) and (B) receive the diploma of *Electrical Engineer* or a *Certificate of Electro-technical Studies*, according as the average of their examination and study marks is between 15 and 20 or between 10 and 15.

Students who matriculate and have followed with advantage the instruction given at the Institute may easily obtain the certificates of higher studies in industrial physics and electro-chemistry, which, when added to another certificate of higher studies, entitles to the degree of Licentiate.

DIPLOMA OF ELECTRICAL ENGINEERS.

Engineers who hold diplomas of the large French or foreign schools, and technicians whose acquirements are considered sufficient, may be admitted by the dean as candidates for the diploma of Electrical Engineer on the proposal of the director of the Institute, after an examination of their claims and within the limit of places available at the laboratory. For the students in this category the curriculum comprises only two half-years of supplementary studies at the Institute (from November 15 to July 14 following).

The final examination comprises: (1) a written test consisting of a draft of an electric installation, with plans and specification; (2) a practical test consisting of personal researches made in a subject given beforehand; and (3) an oral test in theoretical and practical electro-technics.

The fees are:—registration 20 francs; library 10; laboratory 125 per quarter; examination 30; total 560 francs.

A special section is reserved for ex-pupils who hold diplomas from the Schools of Arts and Trades.

An elementary division, for which the entrance examination corresponds to the instruction given in the Higher Primary Schools, in the Practical Schools of Commerce and Industry, or in the 4th B class in the Lyceums, enables young persons under 16 years of age who are candidates for ordinary electrical *engineer's certificates*, to acquire in one year knowledge corresponding to this first degree of practical electric science. The fees for practical work in this elementary division are 200 francs.

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CHAPTER XXXVII: DRAWING DESIGN AND ART.

INSTRUCTION IN DRAWING IN FRANCE.

Instruction in drawing of some sort is commenced even at the Kindergarten, where it precedes instruction in writing. It is completed in the elementary Primary Schools, and reaches a rather considerable development in the Higher Primary Schools.

As the Higher Primary School is open to only a small number of selected pupils, the city of Paris, which appreciates the fact that drawing is the basis of all vocational instruction, has opened in a certain number of public schools free evening classes in drawing and modelling, intended for apprentices and male adults.

Geometrical drawing in all its applications is taught in these classes, also machine drawing, architectural drawing, cutting of material and tinting; drawing at sight (ornamental and figure) executed from high and low relief, plants, and the living model; also modelling and sculpture.

The courses are open every evening except Saturday, from 8 to 10 p.m., from October 1st to June 30 at 40 different schools.

WHAT PARIS IS DOING.

Up to the present time the city of Paris has established only five courses in drawing for girls. Other classes are in contemplation; but in the meantime the city subsidizes 10 private schools of drawing, on the understanding that they receive a certain number of pupils free of charge. As the instruction in drawing given in these establishments is of a rather general and theoretical character, the city thought proper to complete it by instruction that had more especially in view the applications of the arts of drawing. For this purpose, Paris founded in 1883, two new schools, one for preparatory practical drawing, the other for the application of the arts of drawing to a certain number of industries, of which mention is made further on.

At the same time it founded 5 evening courses where drawing applied to art and industries is taught. These courses are held every evening except Saturday.

Modelling, anatomy, decorative composition and geometrical drawing are taught. Pupils are admitted only after having passed an entrance examination.

SECTION 1: SCHOOLS OF DRAWING.

The study of drawing, formerly considered only from the purely artistic point of view, has considerably widened its scope, so that a knowledge of drawing is of the utmost importance in many occupations. The artist must of course be

a most skilful draftsman, and the architect or engineer, whose art is essentially mathematical, must have constant recourse to drawing. But in order to appreciate the full importance of drawing we must bear in mind that departments such as railways, surveying, forests, bridges and roadways, mines, military engineering, etc., require vast numbers of draftsmen, and that numerous industries, such as calicoes, painted paper, material for hangings, printing on cloth, porcelain, goldsmiths' ware, etc., are continually in need of special draftsmen and skilled artists and designers.

SPECIAL SCHOOLS ESSENTIAL.

In order to satisfy such numerous requirements, it was found necessary to establish special schools devoted to drawing; and even in the programs both of primary and secondary education a rather prominent place had to be given to the teaching of elementary drawing, preparatory to the more extensive study of the art. It is found to be an excellent subject, and of great practical utility even for the pupil who does not intend to follow the draftsman's occupation.

The rudiments of drawing which pupils acquire are extended and completed when they reach the larger schools—the Central School, the Polytechnic School, the School of Bridges and Roadways, the School of Mines, etc.

In the School of Arts and Trades the teaching of drawing is very comprehensive, and has special reference to its applications to arts and manufactures, and particularly to mechanical manufacturing. In the schools of Industrial Drawing, which resemble those of Arts and Trades, draftsmen are trained specially for the various industries, especially for art industries.

Finally, advanced instruction in drawing and in all branches related to it is given in special schools devoted to Fine Arts and Decorative Arts.

STATE SUBSIDIES FOR DRAWING AND ART.

There are numerous schools of drawing in France, the majority of which are subsidized by the State; but although the State exercises control over the teaching, it is far from being uniform, and the programs vary according to the needs of the particular locality or the requirements of the local industries. They admit of applications of drawing to fine arts, to decorative art, or to industrial art.

The instruction is divided into three classes, and comprises generally:

(1) Elementary class,—frechand drawing at the blackboard and on paper, and linear drawing.

(2) Intermediate class,—ornamental drawing and drawing of portions of figures, the practical study of projections (sketches, elevations of plans, levelling, etc.)

(3) Advanced class,—drawing from the figure; general history of art; study of the orders and laws; decorative composition; the application of projections to carpentry, locksmithery, stone-cutting, etc.

There are local and municipal Schools of Fine Arts which are subsidized by the State. Their programs, though of the same nature as those of the National

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Schools of Fine Arts, are usually less complete. In each of them one part is devoted to the industrial application of art, and particularly to decorative art. These modifications in the programs of the National Schools are dictated only by the needs of the local industries.

Local schools of Fine Arts are established at Amiens, Clermont-Ferrand, Montpellier, Nancy, Rennes, Rouen, St. Etienne and Tours. The municipal schools are those of Angers, Avignon, Caen, Grenoble, LeHavre, Lille and Poitiers.

Some of these local and municipal schools are more important than the majority of the National Schools, this difference being due to the fact that the income is administered in the National Schools by the State, but in the others by the cities under the control of the State.

The School of Fine Arts at Toulouse, which was formerly administered by the city, has become a National School.

LOCAL AND NATIONAL SCHOOLS.

In addition to these Schools of Fine Arts supported or subsidized by the State, there are others, such as those at Bordeaux, Besançon and Marseilles, where the instruction is of the same character, and those at Dunkerque and Tourcoing (with a course in architecture) and at Toulon (studio of fine arts), which are sufficiently prosperous to do without the aid of the State. The same remark applies to the School of Sculpture at Grenoble.

The organization and teaching at the Schools of Decorative Art in the Departments (Provinces) have been copied from the National School of Decorative Arts at Paris, the artistic training of which has profoundly affected French industries. These schools have the common object of cultivating the taste and completing the industrial education of workmen and artisans by teaching drawing and the allied arts. Each school covers special instruction adapted to the occupations of the pupils. They are for day scholars. Pupils who are minors, and are introduced by their parents or employers, must know reading writing and arithmetic. Foreigners may be admitted by special permission. The instruction is free, and pupils of both sexes are received.

NATIONAL SCHOOLS OF FINE ARTS.

The National Schools of Fine Arts of the Departments, five in number, situated at Lyons, Algiers, Bourges, Dijon and Toulouse, impart a knowledge of drawing and the kindred arts of painting, sculpture, engraving, architecture, etc. At all these schools the instruction is free; the pupils are day scholars, and must be introduced by parents or employers, if minors, and be able to read, write and figure. Maintenance scholarships may be granted to pupils who have not sufficient means. These scholarships, which may be divided, are furnished either by the Departments (Provinces) or the communes (city or village).

In the Departments (Provinces) there is very little difference between the schools of fine arts, of decorative arts, and of industrial arts. This is not so at Paris, where the National School of Fine Arts aims to give the highest artistic

instruction possible, and this is imparted by the greatest artists of France. The exceptional importance of the School of Fine Arts (the famous *Ecole des Beaux Arts*) at Paris requires separate mention.

MUNICIPAL SCHOOLS OF DRAWING.

Examples of this class of school may be given by referring to those at Lyons. These schools were organized under the same law of December 2, 1876, which established the *Ecole des Beaux Arts*. There are 4 evening schools for male adults, situated in different parts of the city, in which classes are held usually on three evenings weekly, the fee being 3 francs.

In the *Petit-College School* the program comprises: (a) elementary courses covering the principles of geometrical drawing, perspective, casts and ornaments; (b) industrial linear drawing applied to constructions and machines, architecture, and elements of geometry and perspective; (c) higher course from casts, heads and classical subjects; (d) modelling; (f) drawing of flowers from nature, and conventionalizing; (g) decorative art applied to industry.

In the *De la Guillotiere School* the teaching comprises; (a) higher course of figure drawing from the cast; (b) higher course of ornamental drawing from the cast, with application to decorative arts; (c) higher course of modeling, figure and ornament, with applications to decorative arts; (d) drawing in its various applications—first section, linear industrial drawing, perspective, shading, water colors from relief models; second section, application of decorative art to architecture and various industries; (e) preparatory course to the preceding courses, comprising geometrical drawing, perspective, shading and water color, linear and ornamental drawing.

Des Brotteaux School,—The program comprises: (a) course of drawing from the cast, and modeling; (b) linear drawing, geometry, stone-cutting and water colors; elements of architecture, industrial drawing applied to construction from nature; (e) art composition applied to Industry.

De la Croix-Rousse Schools,—The program comprises: (a) course on principles; (b) drawing from the cast, classical; (c) flowers from nature; (d) conventionalizing and application to industry; (e) higher course of ornamental drawing; (f) decorative art, composition and study of styles; (g) linear and mechanical drawing; drawing applied to various industries.

There are two schools for women and girls, as follows:—

Rue de l'Hotel de Ville School,—a drawing school whose program comprises: (a) drawing from the figure (head); (b) ornament from the cast; application of ornament to decoration of objects; (c) special flower course—study of flowers from nature in crayon and water color, with application to industrial arts; (d) elementary composition and style; (e) course on principles; (f) special drawing course on Thursdays; (g) preparatory courses, optional, for examinations as professors or for the *Ecole des Beaux Arts*. Classes meet in the afternoons for three or four hours; preparatory courses one or two hours.

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Municipal Course in Embroidery (artistic hand embroidery); The course lasts 4 years, and comprises the study of various stitches and embroideries of different periods and their applications. Girls of over 14 are admitted who are attending or have attended the Municipal School of Drawing, or who have the necessary knowledge of drawing. The courses are held in the afternoons.

MUNICIPAL PREPARATORY SCHOOL OF PRACTICAL DRAWING, PARIS.

(Germain Pilon School, 12 rue Ste. Elizabeth.)

This school prepares young men to become draftsmen or industrial modelers.

It instructs pupils in drawing, modeling, and molding, not only from the theoretical but also from the practical point of view, with reference to the following specialties: jewelry, goldsmith's art, furniture, painted papers, ceramics, embroidery, lace, lace-making, mosaic, and ironmongery.

The program comprises drawing and modeling from the cast and the living model, watercolor from nature, geometrical drawing, tinting and the theory of shading, perspective, elementary architecture, analysis of styles and decorative composition, anatomy, history of art, designing stuffs and furniture, embroidery and lace making, technological lectures, and practical exercises in molding.

The course takes three years. Instruction is free. Maintenance scholarships may be granted, beginning with the second year. The classes are held from 8 to 11 a.m. and 1 to 5 p.m. Candidates are admitted by competition in June. Candidates must be French, living at Paris or in the Department of the Seine, 13 years of age, if provided with the certificate of studies; otherwise 14.

The competition comprises: drawing an ordinary object of a simple shape, geometrically and in perspective; also French composition.

Evening classes bearing on the program of the school are held during the school year, from October to June 30, from 8 to 10 p.m. daily (except Saturdays and Sundays).

Evening pupils must be at least 15 years of age.

SECTION 2: OTHER SCHOOLS OF DRAWING AND ARTS.

(1) ST. ETIENNE DISTRICT SCHOOL OF INDUSTRIAL ARTS.

This school was established in 1804. It is under the direction of the Minister of Public Instruction and Fine Arts, and is subject to the inspection of his delegates. The staff is appointed by the Prefect of the Department (Loire), on the nomination of the mayor, subject to the approval of the Ministry of Fine Arts. The school is a municipal institution, deriving the great part of its funds from the city. It is under the authority of a director, who receives instructions from a special Council of Improvement.

Students must be not under 12 years old, and of French nationality. Foreigners can be admitted only by special permission of the Prefect.

Some former students have gone to the Ecole des Beaux Arts at Paris, others to the Ecole des Beaux Arts at Lyons, and to the Preparatory School of Architecture at Lyons.

The average number of pupils is 450. There is no definite limit to the course, which sometimes extends over five years.

Evening courses in drawing applied to industry are largely attended by apprentices and others.

Pupils wishing to take up art as a profession go on to the schools at Lyons or Paris after a few years here.

COURSES RELATED TO LOCAL INDUSTRIES.

There are 25 Courses, viz.: 6 in drawing; 6 special courses in elementary and descriptive geometry, perspective, anatomy, history of art, mechanics and geometrical drawing; 13 applied courses covering decorative composition, modeling, architecture, engraving of weapons, incrustation, carving and repoussé, engraving with the hammer, chisel and liquid, mounting on cards and weaving.

The school devotes much of its work to two very old and important industries carried on in St. Etienne, viz. fire-arms and ribbons. Working drawings of ribbon patterns designed from plants are composed by pupils. The fire-arms are engraved, some of the work being executed on the weapons themselves, while others are designed separately. Sometimes the metal is decorated, sometimes the wood.

Few of the pupils turn out full-fledged artists, but they are good engravers on wood and metal, and could be sent to Paris to finish their training.

(2) SCHOOL OF DRAWING AND ART APPLIED TO THE INDUSTRIES, PARIS.

This is a free day school at 24 rue Duperre, intended to train not only skilful industrial draftsmen, but also art workers in the special lines which can be carried on by women.

It comprises elementary and advanced divisions, the instruction in each being both theoretical and vocational. The course is three years. The sessions are held from 8.30 to 11.30 a.m. and 1 to 5.30 p.m.

Elementary Division.—Theoretical instruction comprises: the French language, moral and common law, history and general geography, arithmetic, ordinary geometry, elements of the physical and natural sciences (physics, chemistry, botany, zoology, and physiology); elements of hygiene, of domestic economy, of technology, of art history, and of ornamental composition; and application of geometrical drawing. Vocational instruction comprises: drawing at sight and modeling; geometrical drawing in its applications to the industries; ornamental composition, execution of the compositions given in the theoretical course;

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elements of water-color drawing and wash drawing; elementary work of application, and reproduction of models given at the course in ornamental composition.

Advanced Division.—Theoretical instruction is given by oral courses or lectures bearing on ornamental composition, architecture, history of art, comparative anatomy, applied hygiene, political economy, and labor legislation; also courses in technology in connection with the composition and making of lace, embroidery, upholstery, jewelry, goldsmiths' work, cabinet work, furniture, art ironmongery, ceramics, stained glass, enamels, leathers, ivory, the utilization of the processes of stencilling, batik, photography, etc. Vocational instruction comprises: ornamental composition (realization of the programs laid down by the various art industries); drawing at sight and modeling from the antique and from nature; architectural or geometrical drawing in its industrial applications (panelling, doors, windows, ceilings, interior decoration, adaptation of furniture to its objects, etc.); drawing for laces and various embroideries; drawing for jewelry, goldsmiths' work, and art ironmongery; drawing for painted papers, hangings, silks, printed stuffs, etc.

WORK IN ART INDUSTRIES.

The practical work covers applications to works of art and to the making of the following: lace, various embroideries (costumes, furniture, linen drapery, etc.), painting and water-color drawing on paper, linen cloth, skins, velvet, silk, cloth, wood, glass, ceramics, etc.; applications to works of art which utilise the processes of modeling, molding, stamping, etc., to molding leather, to working in metal, horn, ivory, mother-of pearl, valuable woods, etc.; to tinting stuffs by the processes of batik or pochoir, engraving, miniature figures for styles, etc.; and photography (enlargement, projection, and retouching).

CONDITIONS OF ADMISSION.

Pupils are admitted into each of the divisions of the school by annual competition, usually held in June. Those domiciled outside of the Department of the Seine must pay from 100 to 200 francs annually according to the courses of instruction taken.

For the elementary division candidates must be not less than 13 or over 15 years, but the certificate of primary studies admits at 12 years to the competition, comprising dictation in orthography, which serves also as an examination in writing; a composition; drawing at sight an ordinary object or a cast; elementary geometry and arithmetic; sewing.

For the higher division candidates must be not less than 15 or over 20 on October 1st of year of competition, which comprises graphic examinations, viz., perspective drawing at sight; drawing from the bust; drawing from memory on a reduced scale, examination in perspective and geometrical abstract, and ornamental composition. Oral examinations consist of questions on general history and general geography, on the physical and natural sciences, on

ordinary geography, and projections and linear perspective. An optional examination bearing on all the subjects taught in the higher division.

The following are excused from the competition in the higher division, on fulfilling the conditions as to age and residence: pupils of the elementary division who have obtained the certificate of completed studies; pupils of the "professional" (vocational) schools at Paris who have obtained the certificate of apprenticeship or the diploma of completed professional studies; persons who hold one of the professional diplomas for drawing at sight in the National or municipal schools.

After consultation with the committee of patronage, outside pupils may be admitted to one course or more in the higher division for a fee of from 100 to 250 francs.

(3) NATIONAL SCHOOL OF DECORATIVE ARTS, PARIS.

This School was founded in 1767 under the name of The Royal Free School of Drawing, and was given its new name in 1877. It trains decorative artists and draftsmen for art industries, also constructive and decorative architects. The instruction is free.

The school comprises two sections: one for young men, at 5 rue de l'Ecole-de-Médecine; and one for girls, at 10 bis rue de Seine. Entrance examinations are held twice a year, in October and March. Candidates must be at least 13 and not over 30 in the case of men or 25 in the case of women. They must produce a birth certificate or other document to prove identity and nationality, and must be introduced by their parents or other responsible parties. Foreigners can only be enrolled on the application of the representative of their nation.

The entrance examination for male candidates comprises drawing and modeling from the cast, or architectural composition, according to the section they intend to enter; for girls it consists of drawing from the cast only. The examination extends over five periods of 2 hours each.

Regular attendance is insisted on, and pupils absenting themselves without cause are struck off the list.

YOUNG MEN'S SECTION.

The section for young men is open from 8.30 a. m. to 5 p. m., and from 8 to 10 p. m. The courses comprise; drawing from the antique, figure, ornament, and living model; sketching; course in ornamental composition—theory of composition, exercises on programs given weekly; study of classic styles; study of decoration—plants and natural or manufactured objects suitable for decorative purposes; study of industrial art—practice in composition with a view to its application to various artistic industries, and observations as to technical conditions of wood, furniture, various metals, textile fabrics, papers, printing, binding, glass, stained glass windows, ceramics, etc.; abstract and analysis of classic models; decoration—composition for painted architectural decoration, pasteboard for upholstery, stained glass windows, with use of the

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diagram; modeling—figure and ornament, living model; sculpture—practice in composition with a view to reproduction in wood, bronze, stone, wax, etc., for industrial purposes, also architectural decoration; architecture—special courses for decorators and architects, the latter based upon courses in mathematics, descriptive and analytic geometry, stereotomy, and resistance of materials, thus supplying the necessary scientific knowledge; architectural drawing—study and exercises in composition; architectural composition—theory of composition from the point of view of structure and decoration; study of ancient monuments; exercises in composition on plans and sketches.

In the architectural studio compositions are developed according to program. Special courses in comparative anatomy are open to all students of perspective and art history. Technical lectures are given by artists and the leaders or foremen of manufacturing industries. The pupils are thus initiated into practical methods of execution. Visits to workshops complete this instruction. A course in pedagogics is given to prepare candidates for professorships of drawing under the State or City, by familiarizing them with the various examinations.

SECTION FOR GIRLS.

In the section for girls the courses are open from 9.30 a.m. to 4 p.m., with a holiday on Thursday, except for certain lectures which are held on Thursday morning. The instruction is identical with that given to young men, and the same subjects are taken, comprising drawing, classical studies, ornamental composition, architecture, including analysis of the properties of the various materials used, decoration, and composition. In the decorative studios compositions are studied from the point of view of industrial art. Modeling is also studied, and there are special courses in perspective, comparative anatomy and history of art, as well as technical lectures and a course of pedagogy in preparation for examinations.

Competitions are constantly held in both sections, pupils passing through successive divisions according to their progress. Medals and money prizes are awarded to the most successful pupils, and certificates of studies on graduation. As the school receives pupils of varied degrees of attainment, there is no time limit, the length of the course varying according to the pupil's proficiency on admission. In general, however, a pupil needs to remain 3 or 4 years in order to profit by the instruction, while a decorator who has already been trained in another place may not require more than 1 or 2 years.

There are about 820 pupils in attendance, of whom 120 are girls. The present premises are insufficient, and it is proposed to unite both sections in one building.

(4) LOCAL SCHOOLS OF ARCHITECTURE.

To practise as an architect no diploma is required, but since 1872 the School of Fine Arts, Paris, has granted an architectural diploma which is much sought after. It is quite evident that architects who possess diplomas, that is, who have followed a complete and methodical course of instruction and have

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passed difficult examinations, offer to the public a higher standard of competency than others; yet there are scarcely 600 of these in the whole of France, the majority of architects having been trained haphazard through an apprenticeship.

Local schools of architecture, instituted to furnish young men desirous of entering this profession with facilities for study hitherto lacking, have been established in university cities, where there are more educational facilities than elsewhere. Since the enactment of the law of 1903, under which these schools operate, they have been opened at Lyons, Rouen, Rennes, Marseilles and Lille, and it is intended to establish schools at Bordeaux, Nancy and Toulouse. They are organized on the plan of the architectural section of the School of Fine Arts and lead up to the same diploma, for which examinations are held twice a year in Paris. The programs and studies are the same, except that there is no studio at the school itself, and the pupils choose whichever outside master they prefer.

THE TRAINING OF ARCHITECTS.

The instruction comprises: ornamental drawing, perspective, general history, mathematics and mechanics, descriptive geometry, stereotomy and surveying, physics and chemistry, construction, building legislation, general history of architecture, history of French architecture, decorative composition, theory of architecture, literature, history of art and archaeology, figure drawing, modeling; simultaneous instruction in the three arts—Painting, Sculpture and Architecture.

The examinations, exercises and compositions of the candidates and pupils are decided by boards of examiners of the School of Fine Arts, and conducted by an architect delegated by each local school.

The students are divided into two classes, young men between 15 and 30 being received into the 2nd class by competition, the examinations for which are held twice a year in each school. This examination is open to foreigners. Candidates for the schools of architecture, and visitors, may be authorised to attend the lecture courses.

For promotion to the 1st class, pupils must have obtained medals or distinction in the competition, and worked through the 2nd class. Pupils in the 1st class who have obtained medals or distinctions may obtain a certificate of studies without further examinations.

(5) SCHOOL OF DRAWING AND BUILDING ART.

This school, at 11 rue St. Benoit, Paris, founded in 1901, is intended (1) for young men preparing for the National School of Fine Arts (architectural section), for schools of architecture, or for municipal or departmental government posts (1st division); (2) for candidates for professorships of drawing in lyceums, colleges, normal schools, primary higher schools, and schools and courses of the city of Paris (2nd division). The course is begun by correspondence, and completed at the special studio, where the number of pupils is limited.

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CORRESPONDENCE COURSE.

The school sends lessons and corrected papers to pupils of the 1st division. Every week the pupils receive written lessons on architecture, construction, and stereotomy or geometrical tracing, of which they have to make a graphic application on a synoptic program. In this way they are practised in architectural composition. In their 1st year they study the principles of architecture, perspective outline, stereotomy and construction. In their 2nd, private or public architecture, according to whether they intend to engage in private practice or under the Government. In their 3rd, they make a complete design with all the details of execution.

In the 2nd division, pupils are prepared for the official examinations admitting to professorships. The lessons deal with perspective, shading, history of art, decorative composition, etc. In their 1st year they study drawing, perspective, history of art, applied geometry, and anatomy; in the 2nd, pedagogics and the practice of teaching, passing the first grade or normal school examinations; in their 3rd, they take decorative composition, styles and stylisation, passing the higher grade examination in decorative composition, or those of the city of Paris.

There is a preparatory year for young men who need to perfect themselves in outline drawing, geometrical figures, and descriptive geometry and shading before taking up the special studies.

The cost varies from 8 to 40 francs per month, according to the courses.

COURSE IN SPECIAL STUDIO.

This comprises the same subjects as are taught by correspondence. The weekly division of time is as follows:—

1st Division: (1) study of architecture, comprising graphic documents with corrections, on a synoptic program; 6 lessons of 4 hours each; (2) an outline of architecture, pupil's original work, to be studied and delivered under the conditions of the competition, in 12 hours; (3) a drawing from the cast, model or diagram of descriptive geometry, in 8 hours; (4) questions in mathematics, general geometry and descriptive geometry, algebra and arithmetic; (5) papers in mathematics and history.

2nd Division: (1) a lesson in perspective and a diagram, 8 hours; (2) a lesson on the history of art; (3) a lesson in pedagogics; (4) graphic work in drawing and applied geometry, to be done in the time allotted for the examination test; (5) questions and practice in blackboard drawing.

The studio is open from 8 a. m. to 6 p.m. The monthly enrolment and school fee is 10½ francs, inclusive.

NORMAL CLASS.

Shortly before the examinations, a normal session of pedagogical preparation is arranged, comprising collective questions, lessons in drawing, and graphic tests.

All the teachers in the school hold either State or Paris diplomas.

(6) SCHOOL OF CERAMICS, SEVRES.

This School, annexed to the National Factory at Sevres, is intended to train ceramists.

Pupils are admitted by examination held every July at the factory. Scholarships of 800 francs each, which may be augmented by 100 francs annually, are awarded to poor students.

Candidates must be French, and not under 16 or over 19 at the time of the examination. Applications must be sent to the manager of the factory, with certificates of birth, of primary education, of good conduct and habits, and a memorandum of previous studies and work. The subjects of the examination are as follows:—

Eliminatory Examination: (1) linear and geometrical drawing (abstract and projections); geometrical abstract; plan, elevation and section, if any, of a simple object in relief on a sheet of half size; time 4 hours; (2) arithmetical and geometrical problems, time 3 hours; (3) drawing from the cast on a drawing sheet Ingres size, time 4 hours; (4) freehand drawing of a plant or simple object on a sheet of half great eagle, time 4 hours.

Final Examination: questions in arithmetic, geometry, principles of geometrical drawing, algebra, chemistry and physics.

Physical fitness of candidates for the workshop must be proved by a certificate from the physician at the factory, before the final examination.

The course is 4 years. There is a post-graduate course of 1 year, for which pupils are allowed 1200 francs, and during which they devote themselves to work, the program of which they make up for themselves, but which is subject to the approval of the council of the school.

COURSE OF INSTRUCTION.

The instruction comprises the following courses:

Methods of geometrical drawing, imitative and water-colour drawing, modeling, decorative composition, history of styles and of ceramics, chemistry and ceramic technology, anatomy, turning, molding, repairing and manufacture of molds, study of the various ceramic processes for the decoration of porcelain, laboratory work, technical designs, decorative designs, composition, manufacture and decoration of pieces of pottery, and studies in cooking, muffles and ovens.

3d year.—Turning, molding repairing, manufacture of molds, etc.; application of the various ceramic processes to the decoration of porcelain; general studies in decorative composition; imitative drawing; water-colour drawing; studies at the museum (sketching); geometrical drawing, and modeling.

4th year.—Studies in ceramic painting and decorative composition; imitative drawing, studies from the antique and from nature, and studies in anatomy; composition of designs and application of practical work to execute them; methodical and developed course in decorative composition; modeling; studies at the ceramic museum (sketching); geometrical drawing (designs);

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general manufacturing, practical studies; work in the chemical laboratory; ornamental drawing, and water-colour drawing.

At the end of the course, pupils who maintain the general average of 13 marks are granted the diploma.

SECTION 3: INFORMATION FROM HIGHEST AUTHORITIES.

Information obtained in "Conversation" with MR. LOUIS GUEBIN, Principal Inspector of Drawing in the Schools of the City of Paris.

Drawing in France is compulsory in all primary schools from ages 6 to 12. It is treated like any other subject—like the French language, or arithmetic, or geometry. In the Higher Primary public schools both boys and girls have 3 hours drawing out of a total of 30 hours per week in their general course, while boys in the industrial course have $4\frac{1}{2}$ hours weekly, and in the business and agriculture courses $1\frac{1}{2}$ hours. In the industrial section of the Practical Schools of Commerce and Industry both sexes get 6 hours drawing per week in the first year, while in the second and third years girls get 3 and boys get 7 hours weekly.

All over France drawing is taught by the teachers themselves just as they teach geometry, but large cities have special professors for drawing. In Paris there are about 200 schools for boys and 200 for girls where special professors of drawing come (about 11) to the scholars in the last years of their study at the primary school, to prepare their minds more especially for industrial purposes. These professors are artists in drawing, sculpture, etc. and are chosen after competition.

After taking a primary obligatory course, pupils can go to a supplementary course, then to a special school for drawing, then to a professional school for wood, iron and book-binding. From the special school of design they can go to the School of Fine Arts; after that they do as they like.

There are scholarships of 500 francs given to pupils. After travelling, students return and produce a different quality of work.

DRAWING CONGRESS "COMPETITIONS".

Mr. Guebin was one of the organizers of the International Congress on Drawing and Art at the Paris Exposition in 1900. He explained that so much of importance had been found in this branch of teaching that it was decided to meet every fourth year. Meetings were held at Berne in 1904, London in 1908, and Dresden in 1912. The latter was attended by about 2,000 delegates from all parts of the world. A permanent international federation has been formed to carry on the work.

Mr. Guebin claims that the new method of teaching, adopted in the present French programme, came from the special study made of the question by the International Congress, followed by their suggestions and work. Formerly

this teaching used to be a kind of copying work, based completely on geometrical forms; now pupils study more from Nature, the geometrical forms coming only as a help to enable them to draw the object.

The Commission, in company with Mr. Guebin visited a large hall in the Place de la Concorde, where we found between 200 and 300 girl students of Paris schools, aged about 12 or 13, some 50 of whom were from the continuation courses, in competition for promotion to higher classes. They were making art "compositions" direct from natural flowers, and conventionalizing designs; for this work they are allowed four hours. A similar number of boys were in another part of the building in charge of male teachers. One of the subjects was the decoration of a bon-bon box octagonal in shape. Competitors must furnish a design for the top of the box, then make a drawing for the lateral face of the box.

The first competition (in ordinary drawing) was held the previous week, among 600 students; then out of that number these selected were allowed to compete further in composition, having gained that right by obtaining "special mention" in the ordinary drawing competition. These competitions were instituted ten years ago.

MR. GUEBIN'S PRINCIPLES AND METHODS.

The Commission visited the Normal School of Drawing, a special school established in 1896 for teaching the pedagogy of drawing. Teachers from the primary Normal Schools who wish to teach drawing as a specialty come here to perfect themselves. Principal Guebin and his colleagues give special lectures. The teachers' course is given only on Thursdays throughout one year, equivalent to 25 lessons.

Teachers do not teach drawing as a special subject unrelated to any other, but their general teaching is done by the aid of drawing. The aim is to teach children at from 8 to 10 years so that as soon as form can be understood the children draw that form. Specimens of pre-historic man living in grottos were illustrated by drawings in color.

The vertical line is not treated by Mr. Guebin as an abstraction, but is illustrated by examining the vertical lines on a tree, a telegraph pole, a picket fence, etc. Horizontal lines are illustrated by diagrams of steps, table, boat, water, etc. Oblique lines are represented by drawing a latticed fence, etc.

Drawing is used for teaching language, geography, technical terms, etc. such as desert, plain, etc. and at the same time giving graphic representations of objects.

The three principles underlying M. Guebin's method are:—(1) That the students have liberty of sentiment and even of interpretation—of course comprised within certain limits of correction, gradually becoming more severe. That the master have liberty of action, and encouragement to initiative according to his appropriate temperament. (2) Drawing is studied less for itself than as a means of general education. Everything that will incorporate the matter of the primary studies, and mix with it the intellectual life of the school, shall answer this purpose. Drawing shall be used not as a pleasing art but

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as a general instrument of culture and as a further enforcement of the normal play of the imagination, the sensibility and memory. (3) Nature is taken as a basis; it is loved for itself, and translated directly and naively. Nature is concrete; the drawing must not be abstract. In nature as we see it and as we try to copy it geometry does not exist.

DRAWING CORRELATED WITH LANGUAGE, ETC.

M. Guebin uses drawing for lessons on language. He showed us several illustrations of homonyms—French words for similar objects, e.g., suspended bodies—lamps, bell, etc; bodies resting—tree, wardrobe, etc. Teachers ask scholars for names of suspended objects; for bodies bent against the wall; bodies that appear to have nothing to suspend them, such as aeroplanes. Drawing is used in history teaching, e.g., scenes in connection with the siege of Paris. In geography, ideas were given of Switzerland by a general view in colors of lake and mountains, tunnel, watch, cheese, etc. Three states of water were shown; rain, steam, ice; glass carafe broken by the ice bursting. The history of a river was shown by drawings of bridge, embrochure, another river tumbling into it, springs from which it starts, etc. In physics, the ideas of atmospheric disturbance were shown by drawings representing atmospheric electricity, lightning, trolley cars, electric tramway. Chemistry was illustrated by a volcano emitting sulphur, the spraying of vines, flowers in a bottle, flame of a candle, sulphurous gas. A lesson is given on sulphur and the children are asked to give an account of it by means of illustrations. Three different parts of France were illustrated by special features—pasture, paper-making, etc. Different types of habitation were shown—hut, cottage, tent, chateau, farm, ordinary city house. In one of the children's drawings a stable and chickenhouse were added. Habitations of animals—dog's house, bird's nests, cage for birds, bee-hive, ground mice under a tree. Family life was represented by pot à feu, dishes, vegetables used in making soup, cook skimming from the pot, family at table eating.

HOW CHILDREN ARE TRAINED TO DRAW.

The above drawings are made without regard to accuracy, the object being to get the expression of the personality of the child. Concurrently with this, however, he gives drawings in which he insists on accuracy. He will say to a child, "The object about which I am speaking to you has a round form." The teacher would go to the board and draw a round form and show that it is round. It is instruction by drawing. They leave the child at liberty as far as the execution is concerned, but he is too young to be allowed to choose the object, as he would always select the same thing. When a child is left to choose his own subject he makes a figure from his own idea, whereas by requiring the child to observe an object he makes the idea more definite. Specimens of children's work were produced by M. Guebin showing results under both these conditions. In the first case the eyes and nose were grotesque, while in the other they became quite human.

To train the hand for brush work, simple designs are first cut in paper marked out in dry colors, so that when the pupil starts a similar design in water colors, the colors will not run beyond the line, but will be clear and definite like those cut in paper. Crayons or water colors are used at the option of pupils. Drawing is one thing, and coloring is another. You must not look for form when you color. The theory of colors is taught by showing the different colors.

Nature and geometry are combined by taking a leaf and turning it at different angles, showing the difference in width by means of perspective.

FRENCH AND GERMAN METHODS COMPARED.

Young children, having no sense of comparison, always make their drawings too small. To develop the sense of comparison of sizes there were sheets representing an eyelet and different sizes of circles, rings, etc. up to a large circle, so that children would know about what size to draw a pearl or a ring. Another device used to represent relation of sizes was a sheet showing heads and hats, pots and covers, letters and envelopes, keys and key-holes, etc.

To illustrate places and positions there were drawings of things on top, at the side, inverse, behind, etc. To show perspective he has pictures representing scenes at different angles—similar ones being pasted on the same sheet so as to impress the point. Thus to represent the idea of convergence he gives a view of birds (side view); also bodies in a circle.

M. Guebin has carefully worked out his pedagogical plan, covering analysis, synthesis, applications of art, etc. He gave us an analysis of the German method of drawing. The elements are initiation, presentation, direction, quantity, distance. Fig. 1 was drawn from nature to the best of the pupil's knowledge. Fig. 2 simplifies the object of his drawing. He puts his first drawing away and he returns to the object, drawing it in a different position. In Fig. 3 he simplifies again. Then from memory he makes Fig. 4, showing the object in that new position which he has taken. Then in the fifth exercise he takes back the model and puts it in the same position as his fourth drawing, and draws it there finally.

"CONVERSATION" WITH AN ENGINEER.

Information obtained in "Conversation" with MR. M. L. FRANCKEN, Engineer, Professor in the schools of the city of Paris, Officer of Public Instruction, Author of "The Teaching of Drawing and its Professional Applications."

The first principles of drawing should be taught to every person from an early age, so as to put the child into a position to express himself with its aid. A child of two or three years old draws naturally, and all the teacher has to do is to develop and direct this natural faculty. If we go the right way and develop this natural instinct of the child we have no effort to teach him how to draw. Look at the future, and see what enormous advantages this boy will have in later life if he knows drawing.

When a child first comes to school we teach him how to write, without reference to his special future occupation. We do not tell him, "You shall be a poet; you shall be a romancer, a great writer," etc. It should be the same with

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drawing. After this starting point there will of course be some branching out in different professions, those who want to go to workshops, or to higher courses of arts, or to engineering, etc., being directed in that way.

Mr. Francken claims that every profession should know how to draw, for this skill is as useful to a litterateur as to a mariner. Drawing helps every trade in the world; every station in life will take a young man if he knows drawing. Ordinary commerce, selling goods, would not seem to require any notion of drawing; but such men sometimes have to compile statistics, and if they can do so by graphic methods, these are more telling and more exact than ordinary figures. Again, a man who sells dry goods will be interested in coloring, and would be glad to know how to mix colors so as to produce a good effect instead of a bad one.

DEVELOPMENT OF POPULAR TASTE.

If a clever workman who knows drawing produces a fine piece of workmanship, how can he sell his work to a rich man who has no notion of what is artistic and pretty? Hence all classes should know drawing. The teaching of teachers of drawing must be continued, and taste must be developed. To be able to draw, even to be an artist, is quite different from being prepared to teach drawing properly, for a man cannot be a good teacher of drawing simply because he is an artist; he must make a special study in order to teach drawing.

Mr. Francken claims that drawing does not interfere with general school instruction, but on the contrary if taught properly may be a means of reducing the time now spent in teaching geography, history, natural history, and other subjects.

Before 1865 France practically did not teach drawing universally in the schools, but it received confirmation in 1867 when a great Commission investigated the matter at the time the Exhibition was held in Paris. It was only in 1900 that this instruction was generalized in primary schools, but drawing was then only optional, not compulsory, in the certificate of primary schools, at the age of 12. It was made compulsory only in 1907. Of course drawing was practised in France for a very long time, but to generalize it they had to get the sanction of the law, which was passed only about four or five years ago. Now drawing is compulsory. The International Congress as well as the National Congress had considerable influence in that direction. The latter Congress means a great deal more in influence from the fact that it is National.

"CONVERSATION" WITH SUB-INSPECTOR OF DRAWING.

Information obtained in "Conversation" with M^{lle} DE MONTILLE, Inspector of Drawing for a section of Paris.

In France the fundamental principle is that every child should know how to draw. We give plaster-casts and work from new objects, and make the children draw those things as seriously as though they were all to be great artists. But we do not make it turn to the technical side at once; we do not teach it right away for any certain trade or craft; whereas in Germany the child, from the very

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minute it starts, begins to learn a craft alongside the drawing; therefore German children know the craft better, but never become such good draughtsmen as do the French. We make them do something practical at the same time as we teach them to draw; but while they are doing something that will be useful for a craft, they are not learning the craft itself.

In our examinations one day we will give the children a wall-paper to design, and the next day a table service. Our children know very much less technique than the Germans, but they become better artists.

CHILDREN STUDY ARTISTIC MODELS.

M^{lle} de Montille attended the Art Congress in London in 1908, and observed that the French art was more artistic than any shown there, while the German was stronger in technique. She thinks the reason France gets its artistic taste is that the French children are made to study artistic things; they are accustomed from the very beginning to go to the museums and study the beautiful things there, and are sent on certain days to all the temporary exhibitions that are held.

As an illustration of how good artistic taste permeates France, M^{lle} de Montille said that sometimes, while copying at the Louvre at lunch hour, workmen would come in and stop and look at the pictures, and the observations they would make on them were such as she would not have believed if she had not personally heard them. It is the appreciation of everybody—more like the judgment of the whole people.

Teachers always choose the most beautiful things for teaching. The Greek works are the most beautiful that exist. In regard to the use of the brush for flowers, Paris teachers let the child do pretty much as it likes.

No matter how little, everything must have a reasonable line. The scholars should correct each other. They are sometimes asked to judge which is the best drawing in the class, and they select the best and give the reasons. The children very often do ugly things because they do not know any better.

SECTION 4: SCHOOLS OF FINE ARTS.

NATIONAL SCHOOL OF FINE ARTS, LYONS.

In its organization and teaching this school approaches most nearly that of Paris.

Pupils are admitted from 14 years of age, on proving that they have the necessary education to profit by the courses.

The entrance examination comprises oral examination and competitions. Young people are received from 13 years of age in the preparatory school, where special instruction is given to enable them to pass the entrance examination.

For other candidates there is a session for examination and competition before the re-opening of the school.

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The instruction given to pupils of the preparatory school comprises: geometry; free-hand drawing, study of figure ornament, geometrical drawing, and tinting.

ART APPLIED TO INDUSTRIES.

All pupils, on their entrance to the School of Fine Arts proper, unless they prove that they possess special knowledge, pass successively through the classes of relief and the living model. It is only after they have passed the competitions and promotion examinations that they can enter one of the following practical classes: painting, sculpture, architecture, floral and decorative art, and modeling applied to industry, putting on card, and composition applied to textile fabrics.

Class in relief: Descriptive and perspective geometry; study of the human figure and ornament from the bust; and history of art.

Living model class: Drawing from the living model; and the pupils who aspire to the various applied classes take the following courses: perspective, history of art, and archeology.

Those in the classes in painting, sculpture, and engraving follow a course in anatomy; those in the architectural classes follow courses in stereotomy; and those in the floral and decorative art classes study the industrial applications. A course in modeling is attached to this teaching.

At the end of the school year a competition is held for each of the practical classes; to the 1st prize there is attached 100 francs, and to the 2nd 50 francs.

The Parisian prize is granted every year, after a special competition, in two sections, to the pupil, painter, sculptor, or engraver who is adjudged to be the most capable to follow with profit the courses of the School of Fine Arts at Paris. This prize consists of an annual allowance of 1,800 francs during three years.

NATIONAL SCHOOL OF FINE ARTS, PARIS.

This, the well known "Ecole des Beaux Arts", at 14 rue Bonaparte, Paris, established under the law of Dec. 2, 1876, is devoted to the teaching of painting, sculpture, architecture, copper-plate engraving, engraving on metals and fine stones, engraving with aqua fortis, wood engraving and lithography. The instruction is free and is given:

- (1) By oral public courses in the different branches of art;
- (2) By competitions in the school which for this purpose is divided into three sections—(a) Painting (including copper-plate engraving, engraving with aqua fortis, wood engraving and lithography); (b) Sculpture (including engraving on metals and fine stones); and (c) Architecture;
- (3) By studios to the number of 17—4 for painting; 4 for sculpture; 3 for architecture, and one each for copper-plate engraving, engraving on metals and fine stones, engraving with aqua fortis, wood engraving, lithography and practical sculpture. Each of these studios is conducted by an artist;
- (4) By access to museums, galleries, and school library.

The pupils are all day scholars, and are divided into three groups according to the nature of their work and studies—1st group, pupils in painting and sculpture; 2nd group, pupils in architecture; 3rd group, outside pupils authorized to work in the galleries and to follow the oral courses, but who do not take part in the work of the school proper.

TERMS OF ADMISSION, COURSES, ETC.

Pupils of the first two groups are admitted after examination: they must be at least 15 and not over 30 years; must present their birth certificates; also a document from a well-known artist, a director of an art school, etc., certifying that they are able to pass the entrance examination and to follow the instruction given in the school. Foreigners must also present a letter of introduction from the ambassador, minister or consul-general of their nation, stating the date and place of their birth. While candidates are admitted up to the age of 30, in practice this extreme limit cannot be taken advantage of, as all pupils cease to form part of the school on reaching the age of 30.

Entrance examinations take place twice a year, viz., for painters and sculptors in October and April; and for architects in July and December. They constitute for painters, sculptors and engravers what is called the competition for places. For architects these examinations admit to the second class. Enrolments close five days before the date of the first examination.

The pupils of the third group (candidates), when introduced by an artist, obtain a card of admission permitting them to follow the oral courses, to have access to the collections and to the library, and to draw in the galleries, where they receive the advice of their professors.

Since 1897 women have been admitted to this school under the same conditions as men.

The oral courses and instruction by means of the collections and the library are attended by the first and second groups of pupils of the school proper and any other persons (candidates or others) who have obtained cards of admission.

The oral courses comprise: In the sections of painting and sculpture—Anatomy, history, archeology, perspective, esthetics and art history. In the section of architecture—Mathematics, descriptive geometry, stereotomy and laying out plans, physics, chemistry and geology, perspective, construction, building legislation, general history of architecture, French architecture and theory of architecture. Courses common to all above sections are general history and literature.

COURSES OUTSIDE OF THE STUDIOS.

In the sections of Painting and Sculpture, under the name of *evening school*, practical courses in Drawing and Sculpture are given daily from 4 to 6 p.m. Pupil-painters, sculptors and engravers who succeeded at the previous competition for places alone are admitted. Every week a new model is given as a subject for study, alternating between antique and nature. For sculptors only, a course is

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given in sculpture on stone and marble, intended to train practical sculptors. Ten professors (five painters and five sculptors) chosen from among the leading French artists, each conduct the evening school during one month.

In the section of Architecture a special course in ornamental drawing has been opened for pupil-architects.

Under the name of simultaneous instruction in the three arts, courses are given in modeling, elementary architecture and decorative composition, open to the pupils admitted to all the sections.

THE SCHOOL PROPER AND THE STUDIOS.

The pupils of the school proper participate in the practical studies and in the competitions, may obtain rewards and qualifications, and may also be admitted to the studios of the school, though many, if not the majority of the pupils of the school, attend private studios. These have the same rights of competition, duties, privileges and rewards as those who attend the school studios. The competitions in the three sections are very numerous, being held quarterly, semi-annually or annually. After these competitions "mentions", third medals, second medals and first medals are granted. Sums of money are attached to some of the principal rewards. In order to take part in certain competitions the pupil must have obtained distinctions in previous competitions. To each reward there is assigned a definite number of marks or values, from $\frac{1}{2}$ up to 5. The total value obtained by a pupil is the figure he retains during his whole stay at the school, and which decides his rank as well as his right to take part in certain competitions.

In the section of Painting and Sculpture there are competitions in which the pupils of the school proper alone can take part, and others which are common to the pupils who have been admitted and to those who have not been admitted to the school proper. Pupils who are successful at these competitions may be excused from entrance examinations to the school proper.

The studios of the school are open (1) to the pupils of the school proper, who choose, in order of seniority and according to their rank of admission, one of the studios in their section in which they desire to study; (2) to young persons who have not been admitted to the school proper, but who are accepted by the professor. Each of the private studios is under whatever regulations the chief of the studio imposes.

COMPETITIONS IN PAINTING AND SCULPTURE.

In the sections of Painting and Sculpture the entrance examinations are called competitions for places.

In the section of Painting, comprising also copper-plate engraving, the preliminary (eliminatory) examination comprises a face drawn from nature, at one of the sessions, and from the antique at the other session. The entrance examinations comprise: 1st, anatomical drawing (osteology); 2nd, perspective drawing; 3rd, fragment of face drawn from the antique; 4th, elementary study

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of architecture; 5th, examination (written or oral at the choice of the candidate) on general elements of history.

In the section of Sculpture (comprising also engraving on metals and fine stones) the preliminary examination (eliminary) comprises a face modelled from nature, at one of the sessions, and from the antique at the other session. The entrance examination is identical with those in the section of Painting, but omitting perspective drawing.

Admission holds good only for six months, or rather till the session of the following examinations. In order to continue to form part of the school proper the pupil must after that time undergo new entrance examinations unless he has obtained certain rewards after the competitions.

WORK DONE IN STUDIOS.

The following is a summary of the work in the studios:

Painters: Exercises in drawing and painting from nature and from the antique. Exercises in composition. Exercises in decorative composition.

Engravers in Copper-plate: Elementary exercises in engraving. Exercises in engraving either from the prints of the masters or from drawings executed by the pupil. Faces drawn from the engraving and from the antique. Exercises in decorative composition.

Sculptors: Exercises in modelling from nature and from the antique, either in high relief or in low relief. Exercises in decorative composition.

Engravers on metals and fine stones: Elementary exercises in engraving. Exercises in engraving, either from metals or the antique, engraved stones or models executed by the pupil. Figures drawn or modelled in bas relief from nature and from the antique. Exercises in composition on metals and cameos.

SECTION OF ARCHITECTURE.

This section comprises two divisions, the second and the first class.

The entrance examinations to the 2nd class consist of an architectural composition executed in a separate room in 12 hours. Only candidates who pass this examination are authorized to enter for the following examinations: (1) drawing of a head or of an ornament from the plaster, to be executed in 8 hours.

The 90 Frenchmen who obtain the greatest number of marks and the thirty foreigners (comprising the proportion who are admissible) are alone authorised to enter for the following examinations: (1) exercises (done in separate room) in calculus, one being in logarithmic calculus; also an examination in arithmetic, algebra and elementary geometry; (2) descriptive geometry applied to an architectural projection (done in a separate room in 8 hours); (3) an oral examination and written composition on the elements of general history.

The number of admissions after examination is limited to 45 Frenchmen and 15 foreigners.

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When once a pupil has been admitted to the Architectural Section of the school it is final, at least for those pupils who fulfil the conditions imposed by the school regulations, whereas pupils of the section of Painting and Sculpture are admitted for only six months.

For students of architecture the work of the studio consists in scientific exercises and exercises in composition. The pupils pass from the second class to the first class as soon as they have obtained a certain number of marks after the periodical competitions. The duration of the stay in the first class is variable, depending on the pupil's merits. The studies which lead to the architectural diploma last six years on the average, though some pupils have obtained it after four years of study after entering the second class.

Pupil architects may obtain the diploma of Architecture by final competition to which are admitted only those who have obtained a sufficient number of marks at the previous competitions. The subject matter consists of an architectural plan conceived and developed as if it were to be executed. To this is added an oral examination on the different parts of the plan, on the theoretical and practical parts of the construction, on physics and chemistry, on building legislation, and on the history of architecture.

SIMULTANEOUS TEACHING OF THE THREE ARTS.

The pupils in each section are initiated into the elements of the arts of the other sections. These studies are limited as follows:—

Section of Painting: Figures, modelled alternately from nature and from the antique, and elementary exercises in architecture.

Section of Sculpture: Figures, drawn alternately from nature and the antique, and elementary exercises in architecture.

Section of Architecture: Ornamental drawing. Drawing of figures from nature or from plaster. Ornamental modelling, and occasionally figure modelling from plaster.

THE ROMAN PRIZE. ("Prix de Rome.")

The dream indulged in by many artists and by all the brilliant scholars of the School of Fine Arts is to obtain the great Roman prize, the principal advantage connected with which is a four years' residence in Italy at the expense of the State. The competition, which is absolutely public, is under the direction of the Academy of Fine Arts. The examinations take place at the School of Fine Arts, which alone has quarters suitable for a competition of this magnitude. In order to be admitted to this competition it is necessary to be French, to be over 15 and not less than 30 years of age, to be unmarried, and to be furnished with a certificate of capacity from a professor or a well-known artist.

The competition for the grand prizes in Painting, Sculpture and Architecture is held every year; for the grand prize in copper-plate engraving every second year only; and for the grand prize for engraving on metals and fine stones every third year. In 1905 for the first time a young lady was admitted to the final competition for the Roman prize in Painting.

Every competition is divided into trial and final competitions. The former take place in March or April. The competitors execute their final work in a separate room, and cannot communicate among themselves or receive any outsiders except the models. The duration of the stay in a separate room is: for painters and sculptors 72 days; copper-plate engravers 90 days; engravers on fine stones 96 days; architects 110 days.

For each competition three prizes are given, to which pecuniary rewards are attached. The winners of the first grand prizes are called boarders of the French Academy at Rome, and are lodged at the Villa Medici. The work they send in is exhibited publicly at the School of Fine Arts in Paris. Every boarder receives 600 francs for the expenses of his journey from Paris to Rome, and the same amount for the return trip. The yearly salary is 2,310 francs, besides the boarding indemnity of 200 francs. Moreover at the end of each year the students are reimbursed for the cost of their studies. During the first year of their board they travel in Italy; the second year they may travel in Italy and Sicily. The pupil painters of the third year may be authorized to execute the usual copy in a foreign museum outside of Italy. When they travel their salary is paid to them at the rate of 267½ francs per month.

The architects spend their fourth year in Greece, and when starting out they receive an indemnity of 800 francs. They may even go beyond Greece and extend their studies as far as Egypt or Asia Minor.

CHAPTER XXXVIII: SCHOOLS FOR SPECIAL INDUSTRIES.*

SECTION 1: NATIONAL SCHOOL OF WATERS AND FORESTS, NANCY.

This school is intended to insure the recruitment of the superior staff of the administration of Waters and Forests, both in France and in the French colonies. All the pupils have been recruited from amongst graduates of the Agronomic Institute. Graduates of the Polytechnic School also may be admitted without competition.

Graduates of the Agronomic Institute who are candidates for the School of Forestry must be under 23 years of age on January 1st of the year in which they present themselves, and must obtain an average of at least 15 marks in mathematics and in special acquirements in German or English. To this end, when leaving the Institute, they undergo a special final examination on a modern language, which comprises an exercise at the board, the explanation of a text from the open book, and questions in German or English.

The number of pupils admitted to the school annually must not exceed 18, 2 of these being intended for Algeria under decree of July, 1909.

The pupils follow a two-years' course at the school, during which they receive a salary of 1200 francs. This salary is swallowed up by the cost of food and quartering in barracks. When pupils first enter the school the parents must also expend 1200 francs for equipment and uniforms, besides 600 francs annually to defray cost of journeys, riding lessons, etc.

MILITARY SERVICE.

In pursuance of the law of March 21, 1905, those pupils, who have been admitted and declared fit for military service, contract a military engagement for 4 years. They complete one year's service before entering the school; the two school years count as if passed in the army; then having passed the final examinations they complete their military service by passing a 4th year as sub-lieutenants of the reserves. The school may accept pupils who have not yet been recognised as fit for military service, in case this disability is the result of constitutional weakness only, and appears to be capable of improvement in time; but pupils who, on graduating, do not possess the physique required for military service, and those who have not fulfilled the requisite conditions for appointment as sub-lieutenants of the reserves, are, under decree of 1909, removed from the list of the personnel of Waters and Forests.

*Reports on Schools for Miners, Schools for Fishermen, Schools of Navigation, and Schools for the Tanning and Leather Industries are to be found at the end of Part III.

The instruction given at the school embraces a thorough study of the scientific and economical management of forests.

SUBJECTS OF STUDY.

(1) *The forestry sciences*, viz., silviculture, forestry technology, dendrometry, forestry economy, pastoral economy, forestry statistics, the valuation of forestry properties, and history of forestry sciences (150 lessons of $1\frac{1}{2}$ hours);

(2) *Natural applied sciences*, consisting of the applications to forestry of botany, mineralogy, geology, zoology, and especially of pisciculture and entomology (150 lessons of $1\frac{1}{2}$ hours);

(3) *Forestry legislation*, which extends far beyond the limits of the forestry code of 1827, and embraces the important portions of civil law, administrative and penal law, legislation on public works applied to the restoration of mountains, also fishing, hunting, and the destruction of noxious animals (100 lessons of $1\frac{1}{2}$ hours.);

(4) *Applied mathematics* in relation to topography, means of transportation in forests (routes, railways, etc.), rudiments of applied mechanics, bridge construction, sawmills and forestry buildings, and the correction of streams and agricultural hydraulics (100 lessons of $1\frac{1}{2}$ hours);

(5) *Modern languages* (German and English), in relation to the reading and explanation of German and English authors on forestry (60 lessons of 1 hour);

(6) *Military art*, comprising all matters necessary for officers who must take their place in the national army in time of war.

Since the decree of December 30, 1897, which widens the powers of the administration of Waters and Forests as regards pastoral improvements, fishing and pisciculture, all these subjects have been developed extensively in most of the branches of instruction.

SCHOOL YEAR; HOW ARRANGED.

Each school year is divided into two parts, the winter term of $6\frac{1}{2}$ months being devoted to theoretical and practical studies, and the summer term of $2\frac{1}{2}$ months to applying these studies to the land, and to preparing for the examinations which occupy one month at the end of the year.

During the winter term, one day every week is devoted to practical education, the other days being taken up by courses and studies. The school contains large collections of natural history objects, woods and forestry products, which are utilised under the direction of the professors. There is also a library of considerable extent, which includes the majority of French and foreign works on forestry subjects.

Country excursions take place, either in the neighborhood of Nancy or in other parts of France. In this way, the 2nd year division prepares plans for the management of foliated and resinous forests, and then prepares studies in the Alps with relation to the correction of streams. Likewise, the 1st year pupils visit the Vosges, Jura, or the Paris basin, the oak forests of the west, and the pine forests of the Landes.

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Although this is a boarding school, the pupils enjoy a fair amount of liberty, similar to that of pupil-officers at the school of Fontainebleau. Their meals are served by the school outside the establishment, and after these meals they may take their recreations in the city. They have also their evenings free. They are compelled to wear the uniform and carry a sword.

CLASSIFICATION OF PUPILS.

The pupils are classified according to the marks obtained at the examinations and the practical work. Two classifications are made every year: one at the end of the winter term, and the other after the excursions and the general examination. At this latter examination the results of the classification at the end of the term are counted as one-half. Any pupil who has not secured a total number of marks equal to half of the maximum total number belonging to the corresponding year is suspended. The same applies to those who have not obtained 8 (out of 20), in forestry or natural sciences, and 6 in the other subjects of instruction. At the end of the second year, or during that year, when a course is completed, the pupils are examined by a jury of 3 professors, presided over by the director. They are likewise examined from the point of view of military education by a commission presided over by a superior officer. According to their final standing they are permitted to choose their probationary residence from a list prepared by the administration; and those who obtain a general average of 15, out of the total number of marks, immediately receive the rank and salary of third-class general guards.

Young men who have graduated from this school attain the rank of inspector, at 4,000 francs, at about the age of 42; nearly all become first-class inspectors, at a salary of 6,000 francs; the most favored ones attain the rank of commissioner, with salaries of from 8,000 to 12,000 francs.

The service comprises 300 general guards and 215 deputy inspectors, who perform the same duties under the orders of 300 inspectors and 32 commissioners.

OUTSIDE STUDENTS.

The school also receives pupils who do not intend to enter the employ of the administration of Waters and Forests. They may be of either French or foreign nationality. Both are admitted free to the courses and the practical work, without undergoing an entrance examination.

The education given by the French School of Waters and Forests is highly esteemed throughout the entire world, and the courses have always been attended by a large number of foreigners.

Certain governments have special agreements with France which determine the courses for which attendance shall be required. The admission of these foreigners does not entitle them to the receipt of any salary. In this way, from 1868 to 1886, England sent to Nancy young men who were intended for the Forestry Service of India; Belgium likewise has for a long time past sent to Nancy its forestry candidates who have graduated from the agricultural institutes at

Gembloux and Louvain. By virtue of similar agreements, foreigners may be admitted to the school as boarders. The education they receive at Nancy is perfectly suited to future managers of private forests or to young men who will have to administer rural estates.

For some years past the course in forestry sciences taught at the school has comprised a series of lessons with special reference to the forests of the French colonies. This course is attached to the division of colonial studies organised at the university of Nancy. The whole constitutes the best preparation for young men who are intended for the colonial administration or for colonisation.

STATION OF FORESTRY INVESTIGATION AND EXPERIMENTS.

There is attached to this school at Nancy a station for investigations and experiments, with a staff of two forestry agents, carried on with the collaboration of the school professors, and intended to aid theoretical instruction by experiments and by operations in which the students can participate. To this end, the station has the technical control of about 3000 hectares of forests, the majority of these being situated in the neighborhood of Nancy, and some in the resinous district of the Vosges. In these places various methods of treatment and cultivation are carried out, whilst conforming to the arrangements approved by the administration.

Besides these, the station manages, under similar conditions, an arboretum and a piscicultural establishment in the neighborhood of Nancy.

Besides the management proper, the experiments carried out in this field of studies comprise observations on forestry meteorology, which have been continued during the last 25 years and have yielded valuable results; and also a very varied mass of investigations, the program of which is decided on by the director of the school, and which regards a great number of important points in silviculture and forestry physiology.

SECTION 2 : MUNICIPAL SCHOOL OF SILK WEAVING OF LYONS.

This school was begun as an apprentices' workshop, was then transformed into a regular school, and became a municipal school in 1884.

Its aim is to give young men complete theoretical and practical instruction on silk weaving, in order to enable them to enter the trade or to perfect themselves in the silk weaving industry.

It has now 340 students, both day and evening; some also attend on Sunday mornings.

The school has 14 looms. As far as possible, it prefers to get machines of different construction from all parts of the world, and, if possible, built on different principles, so as to give pupils experience in all kinds.

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Students come at the age of 15; but a few exceptions may be made. The evening and Sunday morning courses are for apprentices, and include practical work. The evening course lasts three years. Day pupils take a one-year course, but they have 8 hours every day, and 14 hours of theory every week, besides practice in using the machines and making plans. •

When these day pupils leave the school they have merely a foundation for their future work. They then go into stores where they sell silk, and gradually become more expert in the work; and they might become heads of factories, but are not competent workmen.

Teachers are generally taken from the trade, by means of a competition which is open to everybody. The city spends 40,000 francs annually to support the school. The income from the sale of certain goods made by the pupils is between 3000 and 4000 francs. The fee for Frenchmen is 125 francs and for foreigners 300 francs. Poor students pay only the registration fee of 3 francs. There are also scholarships. Evening school pupils pay only the registration fee of 3 francs.

There is an examination every three months, and when a pupil has passed this and the final examination at the end of the year he gets a diploma.

The students do not make designs; these are furnished by the school. They are taught to assemble machines and to take them apart, and spend some weeks doing that work, but they are unable to repair a machine.

IN THE SUPERIOR SCHOOL.

In the Superior School of Commerce, Lyons, there is a silk weaving department, attended chiefly by sons of owners of silk works. The students buy silk and prepare it; take machines down and put them together again.

The boys make the larger drawing of patterns, but the original one is made by the professor. In the local school of Fine Arts there is a special class for teaching drawing for fabrics. These designs come down here, and from them the boys make the larger working drawings. The boys know whether the design is workable on a machine, because they have to make a working drawing.

In the first year the students have to do hand work. The finer qualities of work have to be done by hand. One student took an idea from a pattern on a calendar and worked it up.

The school contains cases showing silk made by silk-worms from mulberry and oak; also showing the various processes for the production of silk—the primary process showing the silk unrolled from the cocoon in hot water.

The Silk Museum in connection with the Lyons Chamber of Commerce was visited. This museum is used by students for copying patterns and getting suggestions for designs. The collection of rare fabrics is extremely valuable, one small square with unique pattern and history being insured for 800,000 francs (about \$160,000).

SECTION 3: FRENCH SCHOOL OF PAPER-MAKING.

(Annex of the Electro-technical Institute of Grenoble.)

This school, which was established on the initiative and under the patronage of the Union of French Paper Manufacturers, is intended to train paper-mill engineers, future directors of factories (higher division), and paper-mill managers, who can finally attain the position of heads of factories (elementary division).

The higher division, which was established on November 1, 1907, comprises two years of study. The first, called the year of general studies, presupposes the same acquirements as for the program of the class in mathematics. The second year, called the year of special studies or of paper-making proper, besides receiving first-year pupils, may receive directly former pupils of the great French and foreign schools (polytechnic, central, arts and trades, mines, etc.). A successful course in the higher division is rewarded by the diploma of Engineer Paper-maker of the University of Grenoble.

The program of first-year studies comprises: elements of physics, chemistry, mathematics, electricity, mechanics, and industrial drawing required by engineer paper-makers. The second year is devoted entirely to the study of paper-making and the allied sciences. The pupils attend both the courses in commercial and industrial law and those of a financial nature.

The duration of the studies in the elementary division is one year, and successful students receive the degree of Manager Paper-maker of the University of Grenoble.

Fees.—Higher Division, 1st year, 260 francs; 2d year, 560 francs; elementary division, 360 francs.

CHAPTER XXXIX: AGRICULTURAL EDUCATION IN FRANCE.

INTRODUCTORY.

According to the provisions of the law of March 28, 1882, the system of agricultural education in France has been carefully organized in elementary schools and in normal schools, and many higher primary and modern secondary schools include a special section of agriculture. Apart from the provision for agricultural instruction as an integral part of general education, France is supplied with special Schools of Agriculture—schools that are models of organization, equipment and method. The reorganized Universities are zealously turning their resources to the service of agriculture.

With the exception of a few private schools, agricultural education is under the control of the State, which pays the expenses, in whole or in part, of such instruction, either through the Ministry of Agriculture alone, or conjointly through this Ministry, the Departments and the Communes.

Agricultural education may be said to be of two kinds: that which is chiefly academic, being given in certain primary, secondary and normal schools under the Minister of Public Instruction by teachers appointed by the Minister of Agriculture; and the technical instruction given in the various Schools of Agriculture.

Notwithstanding these provisions, complaint is made that they have failed to stop the exodus of young men from the farms under the alluring attractions of city life. There is evidently a distinction between the development of agriculture and the uplift of rural life. For the development of agriculture two conditions are fully supplied in France—one of practical education by the District Schools of Agriculture, which rank with the secondary schools of Commerce and of Arts and Trades: and the other by provision for scientific instruction and research by the University laboratories and Experimental Stations.

For the uplift of rural life many agencies are working. But here as in other countries, it is beyond one's power to separate these from the field of education. This field is cultivated for more than the improvement of agriculture as a business; particular attention is given to the development of the workers as citizens and the betterment of their opportunities.

SPECIAL TEACHING IN ORDINARY SCHOOLS.

This consists of lessons in agriculture and horticulture, given either by the Departmental Professors under the Minister of Agriculture, or by the special Professors of Agriculture selected for this work by the same Minister.

The instruction is quite elementary, and is given as one of the usual subjects in the school, in every class, without regard to the future occupation of the pupils.

The course is generally a series of "object lessons," the principal aim being to give an elementary idea of Agricultural Science, and in the primary schools to awaken in the pupils the love of country life, in order to prepare the peasant's son to follow the occupation of his father. In a certain number of schools there is also more practical work, with a garden or experimental plot attached.

In the majority of schools, agriculture is the only subject taught, but where the needs of the district call for it, lessons are given in horticulture, viticulture and arboriculture. The teachers are paid by the Minister of Agriculture, whose servants they are, and the Department and Communes pay a part of the expenses of the experimental plots and the cost of preparing them.

It is admitted that the teaching of agriculture in the elementary schools has proved of little advantage. The general inspector of the branch, M. Leblanc, complains that the lesson is too often a mere repetition of memorized rules; occasionally a teacher is found who turns the plot of ground, belonging to the school or the teacher's house, into a garden for practical instruction and experimentation. Various causes are assigned for this unsatisfactory condition, such as the crowded program and the brief period of school life, disabilities which can be overcome by prolonging the ordinary period of school attendance. The law of January 11, 1890, raised the minimum age at which pupils may enter the examination for the certificate of primary studies from 11 to 12 years.

In the French Normal Schools, the aim of the special lessons is to familiarize the future rural school teacher with the daily life of his pupils and to enable him to give a practical direction to his teaching.

This special instruction is given in 87 Normal Schools for primary teachers by the Departmental Professors, and in 186 Primary and Secondary schools (except in Paris, where 8 teachers divide this work) by the Special Professors of Agriculture.

With a view to its encouragement, prizes are offered to those teachers who show the best results from their instruction. These prizes consist of silver medals together with cash ranging from 100 to 300 francs, and are awarded by the Minister of Public Instruction. The Minister of Agriculture also awards medals to those teachers who are not eligible for the previous medal, but who have nevertheless shown zeal in organizing agricultural instruction.

SECTION 1: FOUR KINDS OF SCHOOLS.

Technical agricultural education, under Government direction, is organized in 4 stages, corresponding roughly to the grades of ordinary instruction, these being as follows:

- I. Farm Schools, 10 in number, corresponding to primary instruction;
- II. Practical Schools of Agriculture, 38 in number, corresponding to higher primary schools;
- III. National Schools of Agriculture, numbering 3, corresponding to secondary schools;
- IV. The National Agronomic Institute, corresponding to University education.

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In addition, there are 4 Special Schools of the rank of National Schools, 11 schools of the class of the Practical Schools, for dairying, agriculture, agricultural industries and stock-keeping, and 8 others, of the farm-school grade, for cheese-making and apple-culture. A few schools are for girls only.

SCHOOLS OF HORTICULTURE.

There is the National School of Horticulture at Versailles and the Municipal School of Horticulture at Paris, the latter, however, not under the Department of Agriculture. Horticulture is also one of the subjects in almost all the agricultural schools.

FARM SCHOOLS.

These are the most elementary of the agricultural schools, and aim to prepare their pupils by practical training for the lower grades of agricultural labor—small farmers working their own farms, foremen, farm-bailiffs, etc. Pupils are required to have the leaving certificate of the elementary school, or to pass the entrance examination, their ages being from 14 to 16. The course covers 2 or 3 years, the pupils living all the time on the farm, where they are boarded, lodged and taught free of charge. They also receive a cash bonus on completion of their studies, of the maximum amount of 300 francs. Their families only have to supply their outfit, which costs from 220 to 250 francs. The boys have to work on the farm about ten hours a day, with additional class work. Each Farm School takes from 20 to 40 pupils, the principal being usually the farmer who often owns and always manages the farm on practical and commercial lines, with a view to making profits for himself. He buys on his own responsibility all the material and stock, and has to pay all the expenses for the keep and instruction of the pupils. On the other hand he retains all the revenue from sales, and receives certain allowances from the Minister of Agriculture—(a) salary for himself and other teachers, (b) 270 francs per annum for each pupil, (c) a general grant for teaching expenses. The total amount of the grant comes on the average to about 15,000 francs per school, exclusive of the cash prizes given to pupils on leaving, which are paid by the Minister.

Certificates from the Minister of Agriculture are awarded on completion of the course and on passing the final examination before a committee on which the Ministry is represented. The schools are inspected by the Department of Agriculture, and the principals have to report regularly. The day of the Farm Schools is evidently past, the tendency being to replace them by Practical Schools which give more instruction and have less apprentice manual work.

PRACTICAL SCHOOLS OF AGRICULTURE.

These are intended for a higher class of pupils, and give more advanced instruction, leading to higher positions. At the same time they only require the same entrance standard as the Farm Schools, and are gradually replacing the latter. The age of admission ranges from 13 to 21. The course extends over 191d—36½

2, 2½ or 3 years. The pupils are usually boarders, the fee being 450 to 600 francs, but as this sum barely covers the cost of board and lodging, it may be said that the instruction is free. The total annual expenses of a pupil are from \$158 to \$200, which includes board and lodging. In the case of necessitous pupils these are met by scholarships or allowances, State grants, and grants from the departments and communes.

The programs of these schools vary considerably, the aim being to adapt the instruction and work to the agricultural conditions of the neighborhood. Consequently some devote themselves to dairying, others to horticulture, viticulture, silviculture or pisciculture. As a rule half the time is devoted to theoretical teaching and the other half to practical work, the pupils putting in not less than 12 hours a day. There are 50 or more pupils in each school. The subjects are more advanced and varied than in the Farm Schools, and there is less manual labor.

The regulations for examinations and certificates are practically the same as in the Farm Schools and the organization is on the same lines, the principal being the farmer, who farms for his own profit. The State gives similar financial aid to these schools, paying salaries of director and teachers, and making a grant for teaching and bursaries. The total amount of grants from the State made to each school varies from 19,600 francs to 20,750 francs.

NATIONAL SCHOOLS OF AGRICULTURE.

These are owned and maintained by the State. They are of a higher grade than the Practical School and have a different aim, which is to give much more general or national instruction than either of the other two classes mentioned.

A higher standard of general education is required and the entrance examination is more difficult, a certain number of marks being allowed to holders of certificates from the Practical Schools of Agriculture and other places. The minimum age for admission is 17. The course is one of 2 or 2½ years. The fee comes to 1,250 or 1,500 francs for boarders, day pupils paying 500 francs a year. There are a certain number of bursaries and scholarships for boarders and day-boys respectively. Their courses deal with cultures of every kind which may be met with in any part of France or in the colonies. The instruction is scientific and technical, and the work on the farm is not heavy, consisting chiefly in helping the staff, supervising, visiting other farms or observing important features of agricultural life. They are designed for young men who intend to manage properties in the country either on their own account or for someone else, or to engage in the work of agricultural instruction.

The Grignon and Montpellier Schools receive boarders, half boarders and day scholars. The Rennes school receives only day scholars. Pupils are admitted by competition and, according to their order on the list, choose the school they wish to enter. The boarders' places especially, which are limited in number, are allotted according to the order of merit.

All three schools receive without examination outside students, who attend the courses to suit their convenience, but who are not admitted either to the study

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halls or to the laboratories, though they may exceptionally be authorized to attend all or part of the practical exercises on payment of a special monthly fee of 25 francs.

Foreigners are admitted as day scholars or outside students. If there are no French candidates, the places available for boarders and half boarders may be allotted to foreign pupils.

The courses begin at Grignon and Montpellier on the second Monday in October, and last for two years and a half. The pupils finish at the end of March in the third year. At Rennes the courses last two years.

QUALIFICATIONS FOR ENTRANCE.

Candidates must be at least 17 years of age on April 1st of the year they are admitted, and must apply to the Minister of Agriculture before June 5th. The written examinations are held on the last Monday and Tuesday in June in eleven cities.

These tests, which are elementary, comprise: (1) a French composition; (2) a paper in mathematics (solution of a problem in arithmetic and of one or two in geometry); (3) a paper in mathematics (solution of a problem in mechanics and of one in algebra or trigonometry); (4) a paper in physics and chemistry; (5) a paper in natural sciences; and (6) a given sketch.

The written compositions are marked by coefficients.

The oral tests bear on mathematics, physics and chemistry, and natural sciences. They can be taken in any one of the four following cities: Paris, Angers, Toulouse or Lyons.

The instruction is given by regular courses and lectures, with application and practical work on the school lands and in the laboratories; and trips are made to agricultural and industrial establishments.

The pupils, while taking part in the various labors and duties of agriculture, get an insight into the details of superintending, carrying out, and managing the work of the farm.

During the vacations (from the end of July to the second Monday in October), the pupils must work on a farm and must draw up a detailed report of what they have observed. For this report they are allowed a mark, which is taken into account in the annual classification.

THE GRIGNON SCHOOL.

Cultivation in its widest sense is studied in this school: sowing meadows with grass, cultivation of cereals, forage plants and industrial plants, investigation of live stock and the agricultural and viticultural industries of Northern France.

The school possesses 125 hectares (368 acres) of arable lands, natural meadows and copses; also a field for work and experiments, kitchen gardens, botanical and silvicultural gardens, a cow-house, a sheepfold, and a piggery for breeding and for experiments. These and the agricultural station complete the equipment for theoretical and practical instruction. The grounds of the school extend over 300 hectares.

Professorships.—agriculture; zoology and animal husbandry; physics, meteorology, and technology; agricultural mineralogy and geology; agricultural engineering, mechanics, machinery, hydraulics, and building; general chemistry and agricultural chemistry; agricultural economics and legislation; botany; silviculture; viticulture and pomology; horticulture; arboriculture; and entomology.

The instruction by the professors, in certain special or secondary branches, is supplemented by lectures given by scholars or agriculturists, or by assistant professors. The subjects of the lectures are the following: entomology, human hygiene, horticulture and market-gardening, dairying, book-keeping, arithmetic, geometry, algebra and trigonometry (subjects preparatory to the course in agricultural engineering), practical agriculture, work in zootechny, analytic chemistry, vegetable pathology, etc.

Every year at the Easter holidays there is an agricultural excursion throughout France or abroad, during which the pupils, accompanied by their professors, visit large agricultural establishments selected from those which are best conducted.

THE NATIONAL INSTITUTE.

The National Agronomic Institute represents the highest grade of agricultural instruction, corresponding to that given in the Faculties of the Universities in other sciences. It is situated at Paris, with experimental farms and gardens in the suburbs. Pupils must be at least 17, and the entrance requirements are higher than any of the other agricultural schools. The course is two years and all pupils are day scholars, the cost being 625 francs. Twenty bursaries are awarded annually, and two travelling scholarships for three years of 375 francs a month. There is a third year limited to 20 students, who each receive 100 francs a month for its duration. The aim of the Institute is to train farmers and proprietors with a real scientific knowledge of agriculture, for the scientific staff of the Department of Agriculture, teachers of agriculture, directors of experimental stations, agricultural engineers and Government agricultural employés. The instruction is entirely scientific and experimental, the practical work consisting of visiting farms and estates, and working on a specified farm during the summer holidays. There are 160 students, 80 in each year, and about 200 candidates for the 80 vacancies.

RELATIONS OF THE SCHOOLS AND THE STATE.

The National Schools and the Agronomic Institute are the property of the State, and are maintained by it. The members of the staff are employés of the Department of Agriculture. This also applies to some other schools. In other cases, the school building and grounds belong either to the State, the provincial authorities, the commune, or to the principal himself. Sometimes the principal is the tenant, renting the land at his own risk, with the assistance and under the inspection of the Minister of Agriculture. Sometimes he is only financed by the latter: in other cases he also receives help from the provincial authorities. As

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a rule, in the Farm Schools and Practical Schools the principal is also the farmer and manages the farm for his own profit like any other farmer. As the allowance from the Department for educational work leaves no profit, provided he does his duty by the pupils, the principal must count on his own farming ability to supplement the salary paid him by the State. The salary of a principal varies from 4,000 to 6,000 francs, and that of a teacher from 2,700 to 4,000 francs.

The number of pupils in agricultural schools of all kinds in France is approximately as follows: Farm Schools and Practical Schools, 2,200 pupils in 48 schools; National Schools, 400 to 500 pupils in 3 schools; Agronomic Institute, 160 pupils.

SECTION 2: DOMESTIC SCHOOLS OF FARMING AND DAIRYING.

These schools for girls are situated at Cœtlogon (Ile-et-Vilaine), Kerliver, commune of Hanvec (Finisterre) and Le Monastier (Haute-Loire). They were established with the aid of the Department of Agriculture, which controls them and maintains scholarships.

Beside these fixed schools, there exist in certain departments (Nord and Pas-de-Calais) Itinerant Schools of Dairying which were established and are maintained by the departments.

Below is a sketch of one each of these two categories of schools.

CÔETLOGON SCHOOL.

This school, established in 1886, with the aid of the department of Ile-et-Vilaine, of the city of Rennes, and of the Chamber of Commerce, is situated two kilometres north of Rennes in one of the healthiest districts. The pupils are boarders.

Its object is: (1) to propagate and develop dairying by training pupils able to apply and spread a knowledge of the best processes and to furnish all useful information on the management of dairies; (2) to give to girls who intend to live in the country such knowledge as is necessary for a farmer's wife, viz.: taking care of the house, attending to tillage, the cow-house, the dairy, the piggery, and the garden; and to enable those who cannot utilize this knowledge at home to get good positions for themselves.

Girls are admitted at the full age of 14 years. They must make request to the directress before July 1st, and hand in certificates of birth, vaccination, good conduct (from the mayor), and a copy of their diplomas or certificates of studies. Those of foreign nationality may be admitted upon authorisation of the Minister of Agriculture. Besides regular pupils, the school receives probationers who come to spend only a few months.

Board is 125 francs a quarter.

Scholarships are maintained by the State and the department. Applicants must, during the first half of August, pass an examination comprising questions on elementary instruction, the French language, orthography, arithmetic and metric system, history and geography of France.

COURSES OF INSTRUCTION.

The instruction lasts for one year, beginning from October. Theoretical instruction embraces household economy, domestic hygiene, technology of milk, elements of animal husbandry, market-gardening and fruit arboriculture; and, lastly, supplementary lessons in French and arithmetic, and especially farm book-keeping. Practical instruction comprises butter and cheese making, care of the poultry yard, some gardening, housekeeping, particularly kitchen work, cutting, sewing and washing.

Pupils who have passed the final examination receive a certificate. Medals may be granted to those most deserving.

Since its foundation the school has received several hundreds of young girls from all parts of France and abroad—Belgium, Russia, England, Germany, Austria, Roumania, Norway and Haiti. Those who did not return to their families to continue to work for their parents have been placed to good advantage by the directress, and over 40 are now directing schools of dairying.

The Kerliver and Monastier schools were organized on the same basis as that of Cœtlogon. They receive boarders, half-boarders and day-scholars. Full board at Kerliver is 400 francs a year, half board 250 (at Monastier 200).

ITINERANT SCHOOL OF DAIRYING AT PAS-DE-CALAIS.

This school was founded by the general council in August, 1906, at the suggestion of M. Tribondeau, departmental professor of agriculture. It is intended to give to young girls the necessary agricultural instruction to enable them to make the most of the products of the farm. It holds sessions of three months in those communes which ask for it and submit to certain definite conditions.

The instruction is both theoretical and practical. Pupils are initiated into the best methods of skimming milk, as well as rational buttermaking and the making of cheese of various kinds. They practise judging the quality of milk, and proportioning the cream by the best processes in use. They are taught farm book-keeping, domestic economy, family hygiene and care of children, and the care of animals, as well as the best conditions under which to feed them. They have lessons on the part which the earth plays in the nourishment of the plant, the importance of ordinary manuring, and the use and composition of the principal chemical manures; the poultry-yard receives special attention. Thus it is seen that this school is a real economic school of farming.

The working plant, furnished by the departments, comprises:—centrifugal cream separators, churns, and a rotary kneader; the necessary articles for the reception, control and analysis of milk and cream; molds and various utensils required for cheesemaking; heating apparatus, kitchen utensils and dishes; articles required for washing and ironing linen; school furniture, tables, chairs, wall pictures and bookcase.

The communes where the school is to be held are bound to furnish suitable premises for its installation. The farmers must undertake to procure the milk

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required for the practical work, 200 litres daily at most. The butter, cheese and by-products are all sent to those interested.

The school is under the authority of the departmental professor of agriculture, who takes charge of the courses in agriculture, animal husbandry, poultry keeping and gardening, and gives the pupils three lectures on agricultural associations. There is also a directress, who takes particular charge of the dairying instruction and work, and a lady teacher to whom is entrusted the instruction in economy.

The tuition is free. Pupils are received from 15 years of age upwards. To have a school opened in a commune there must be at least 15 entries, and if the number is above 20 an entrance examination is held.

COURSES, DIPLOMAS, ETC.

The courses are held daily, except Saturdays, Sundays and holidays. The practical work is done from 8.30 a.m. till noon, and two hours in the afternoon are reserved for theoretical instruction. On two days in the week the pupils prepare the mid-day meal, which they take at joint expense with the teachers.

At the end of the session final examinations are held, and a diploma of fitness is given to those who have obtained at least one-half of the maximum marks attached to the tests.

The school is open to the public on one day in the week, and the farmers and their wives can then assist at all the practical work and note the advantages of the processes employed.

The itinerant school does not turn out pupils as handy and well instructed as do stationary schools; but it has the advantage of reaching families at very little expense to them, and as the pupils live at home they are able to assist their parents both before and after courses. The school also diffuses vocational agricultural instruction wherever necessary. Thus, according to one authority, it is not only "a technical school of apprenticeship, but is a real social work, which is contributing in a large measure to introduce comforts among our rural democracy."

Itinerant schools are in process of organization in other departments, especially in the Somme and the Deux-Sèvres.

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